TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

SEPTEMBER 15, 1960
Price 50c

V. 64 #18

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TECHNOLOGY DEPARTMENT

PROGRESS WITH THE ALL-BURIED SERVICE CONCEPT

Line Concentrators Aid Service Expansion Programs, by C. D. Ehinger

MEASURING FOR GROWTH, by Allan R. Stacey

The Plant Man's Role In The Pre-Wiring Program, by Dick Reynolds

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TELEPHONE ENGINEER & MANAGEMENT

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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

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THE TE&M FRONT COVER

ALICE McCLAIN poses on stage after winning the title of Miss Ohio. With Miss McClain are her parents, Mr. and Mrs. DAVID R. McCLAIN, and her sister, LYNDA LOU, 15. Miss McClain is a revenue accounting clerk with General Telephone Co. of Ohio, and her father is chief plant extension engineer with the company in Marion.

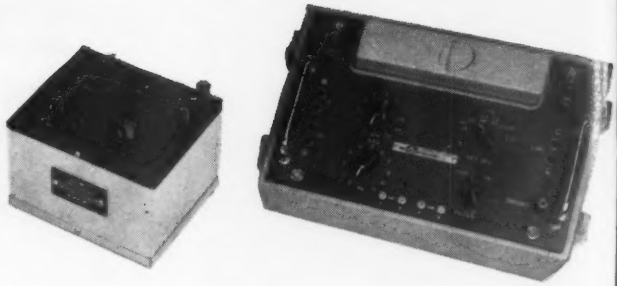
Volume 64, No. 18. Published on the 1st and 15th of each month by TELEPHONE ENGINEER PUBLISHING CORP., 7720 Sheridan Rd., Chicago 26, Ill. Office of Publication, 600 S. 7th St., Rochelle, Ill. Subscriptions, U. S. and Possessions, $4.00 per year; Canada, $4.50; in all other countries, $6.50. Single Copies, U. S. A., 50 cents. Entered as Second Class matter at the post office at Rochelle, Ill. under the act of March 3, 1789. Copyright 1960 by Telephone Engineer Publishing Corp., 7720 N. Sheridan Rd., Chicago 26, Ill.

POSTMASTER . . . Please send form 3579 to TELEPHONE ENGINEER & MANAGEMENT, 7720 N. Sheridan Rd., Chicago 26, Ill.

AIRTRONICS Far-end Terminating Set, designed to be used in conjunction with the Model 20B Test Hybrid, supplies the Far-end terminations required for return loss and singing-point tests.

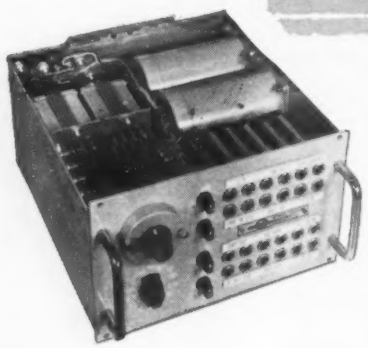
Generally, two precision networks, 115H and 115AL cover the standard cable layouts in exchange plant, (the 115H covering 19 and 22 gauge H88 facilities).

The Far-end Terminating Set consists of a precision network, network build-out decades, selector switch and jacks, and binding posts to give flexible access to the components.

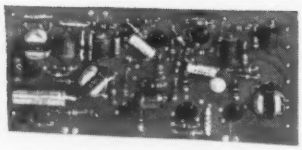


AIRTRONICS new multi-purpose, Portable Test Hybrid Set, Model 20B, makes acceptance, evaluation, and capacity balance tests easier, faster . . . locates cable opens accurately . . . accommodates standard networks. Either Singing-Point or Return Loss techniques can be applied. Accessories include external decade capacitor and variable resistor for use in locating opens, for compromise net, etc. Plug-in dial is also available.

DEPENDABLE PRODUCTS FOR MODERN TELEPHONY

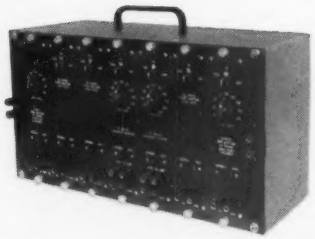


AIRTRONICS completely self-contained Program Equalizer cuts line-up time from hours to minutes. Designed for operating on standard program-loaded or non-loaded communications cables, this unit features pre-tuned circuits in 1½ KC steps from 5 KC to 25 KC. Simple switch adjustments control insertion loss of the LC network, select values of L and C, regulate line-to-drop ratios, control the circuit location of the RLC network etc. Available in portable, wall-mounting, or standard 19" or 23" rack-mounting arrangements.



The Switch-gain Amplifier — in a Speakerphone installation — functions as a voice-sensitive switching pad or loss, which *automatically* lowers loudspeaker volume whenever the subscriber is speaking. Loss is switched electronically to the transmitter channel while the subscriber listens. A guard circuit keeps speaker-to-microphone acoustic feed-back from causing improper switching when the speaker is operating. Net effect is reduction of acoustic coupling between loudspeaker and microphone to a degree where anyone, within 10 or 15 feet, can hear easily and distinctly without feedback or hollowness. Subscriber is not required to vary his gain control when shifting from a near to a more distant connection, or to toll.

AIRTRONICS Switch-gain Amplifier fits all Speakerphone models. Priced under $60 f.o.b.



AIRTRONICS standard Artificial Lines accurately simulate a loaded or non-loaded cable pair of any desired length — from 600 to 39,600 feet.* Multi-position switches afford instant control over total length or load section lengths, so that coil spacings may be set to better than 1%, or as much as 10%. Common irregularities such as bridged taps, mixed loading or coils omitted can be introduced in a moment.

*Available with plug-in units for either #22 or #24 gauge cable, or mixed 22 and 24 gauge. Other commonly used gauges available on special order.

another product FIRST from

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P.O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

THIS GIFT GIVING IDEA IS SO SIMPLE

it's a wonder someone didn't think of it before . . .

If YOU have the problem of selecting the Christmas gifts that must please EVERY ONE of your employees, prospects or customers, the smartest way out is TO LET THEM PICK THEIR OWN GIFTS.

The above pictured GIFT-BOOKARD is the simple, sensible and economical way of doing just that. It enables you to say "Thank You" to anyone . . . without first trying to read their minds . . . and without the inevitable mistakes.

The Gift-Bookard is a combination of personalized Greeting Card, a registered Gift Certificate in the form of a postage paid reply card, and a colorful booklet offering recipients a choice of 24 impressive gifts.

The Gift-Bookard eliminates all work and worry on your part. All you do is order the exact quantity you need, whether 25 or 50,000. We imprint the covers (or you may design and print your own) and supply mailing envelopes. Each person who receives a Gift-Bookard from you picks the one gift he or she prefers, by mailing the attached Registered Gift Certificate card back to us. We supply the gifts, wrap them and ship them prepaid . . . all for only $6.50 each.

A special feature of the Gift-Bookard is the useful and worthwhile nature of the gifts, each of which is valued to $10. and is unconditionally guaranteed. The 24 gifts are shown in full color and almost anyone would enjoy personally choosing and using any of these beautiful gifts.

What's more, you have tastefully exposed your name to the recipients twice . . . once with the Gift-Bookard, then with the gift. You save time, labor and money through group purchasing and handling . . . you create lasting goodwill impressions on your customers, prospects or employees . . . all for the modest $6.50 price.

Fact is, leading executives have said that the Gift-Bookard is the most important new idea for solving the problems inherent in obligatory gift giving to come along in many a year.

The next move is yours. If you'd like to see a sample Gift-Bookard, fill in the coupon below and mail to us – no obligation of course. Or . . . possibly you can refer this ad to someone in your company who might be interested.

IMPORTANT FACTS TO KNOW . . .

The U. S. Senate, in an effort to close "loopholes" in existing tax laws, has recommended a clampdown on tax exemptions for business expenses. The amendment would LIMIT DEDUCTIBLE GIFTS TO A $10 VALUATION.

(This excerpt is from Page 1 of the N. Y. Herald Tribune of June 21st, 1960).

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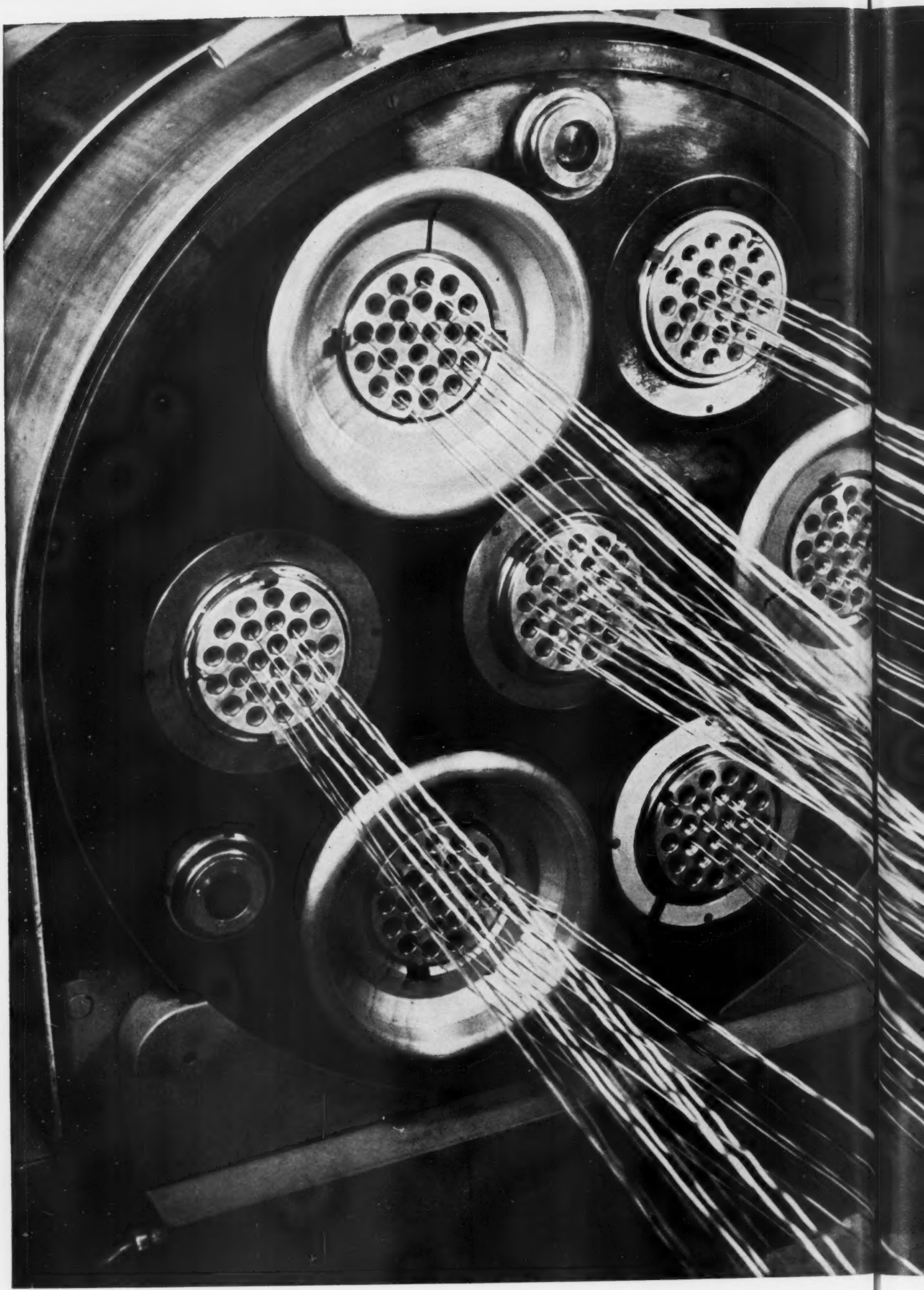

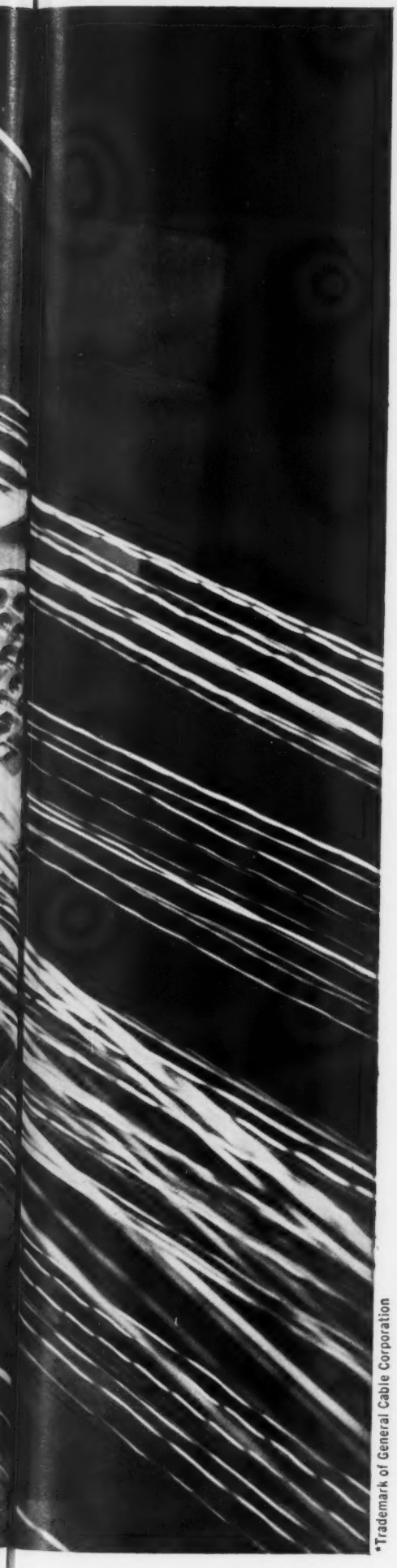

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A NEW LINE OF QUALITY ENGINEERED TELEPHONE CABLES

Only Qualpeth telephone cables offer these new, exclusive features for the finest in transmission and performance. **Reduced cross talk** with a new oscillating face plate method of stranding pairs into units. This method insures freedom from parallelism between a pair in one unit and a pair in another unit. The end result, cross talk characteristics are greatly improved. **Polyethylene binders:** colored polyethylene binder tapes provide easy identification due to color brilliance and freedom from fraying. **Tape over shield:** an acetate tape applied over overlapped edge of smooth shield provides protection against cutting into sheath. **Sheath uniformity gauge:** tests every foot of Qualpeth cable during extrusion for thickness and concentricity of sheath. Upon customer request, Qualpeth cables will be shipped under positive pressure. Your way of checking against hidden shipment and installation damages. Qualpeth cables are available with aluminum or copper shields, in single or double sheaths, for aerial (including new Figure 8 self-supporting messenger type) duct or direct earth burial installation. Call our distributors for complete details about this outstanding line of telephone cables . . . quality-engineered to give you the finest. **Available for shipment on November 1, 1960.** General Cable Corporation, 730 Third Ave., New York 17, N.Y. Offices and Distributing Centers Coast-to-Coast.

Distributed by: Automatic Electric Sales Corporation, Northlake, Illinois; Leich Sales Corporation, 427 West Randolph Street, Chicago 6, Illinois.

GCC GENERAL CABLE CORPORATION

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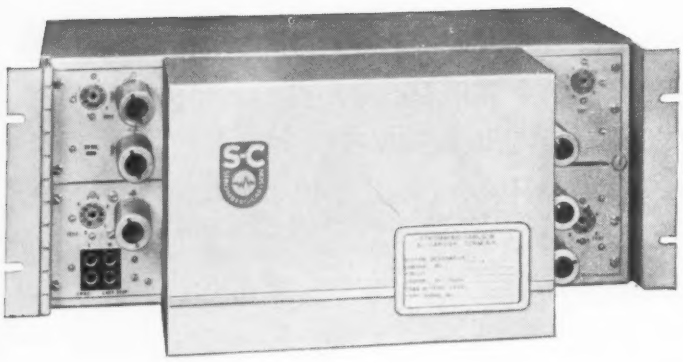

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*Quoted from article in MODERN RAILROADS, March, 1960.
**Company names on request.

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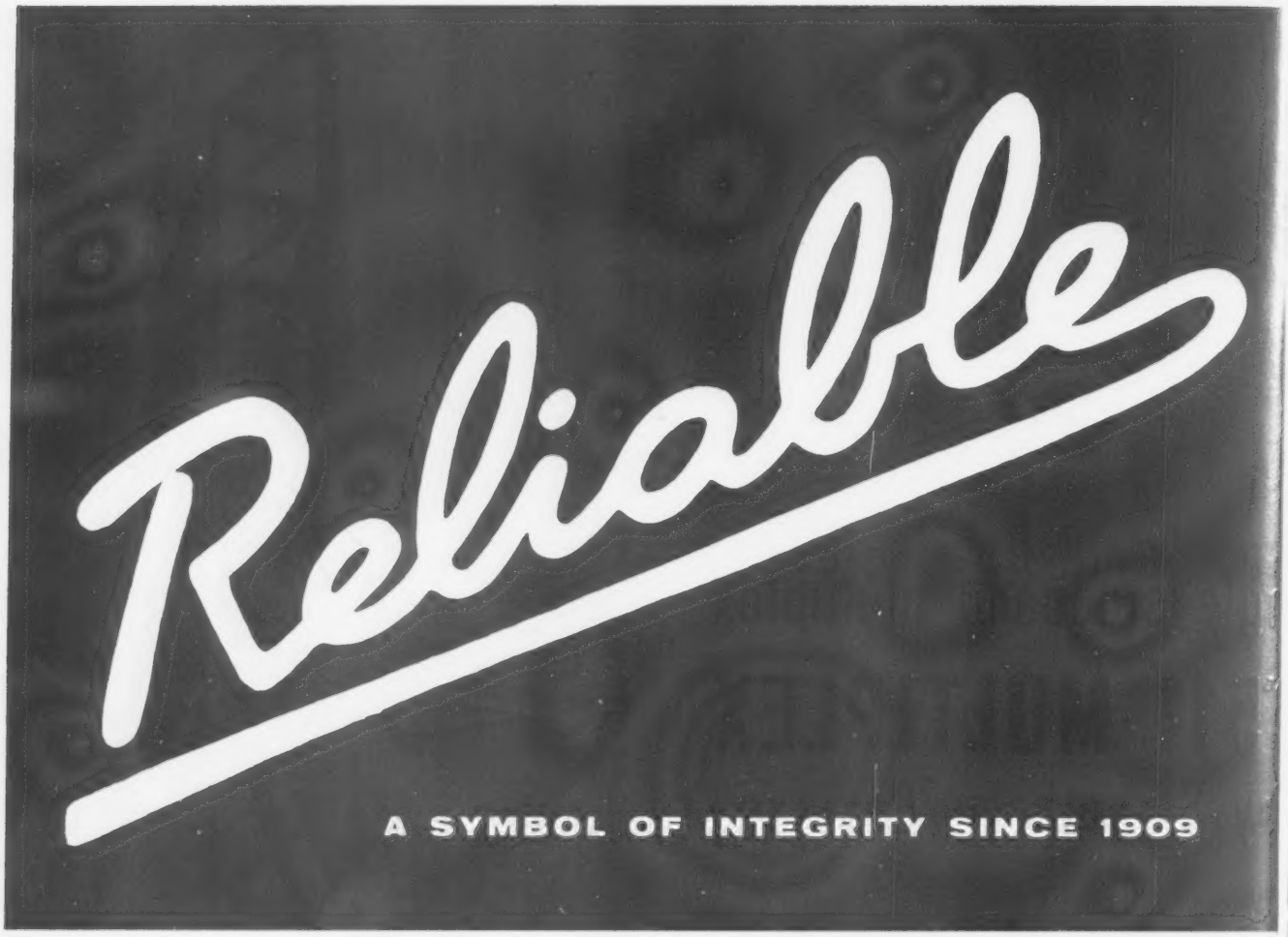

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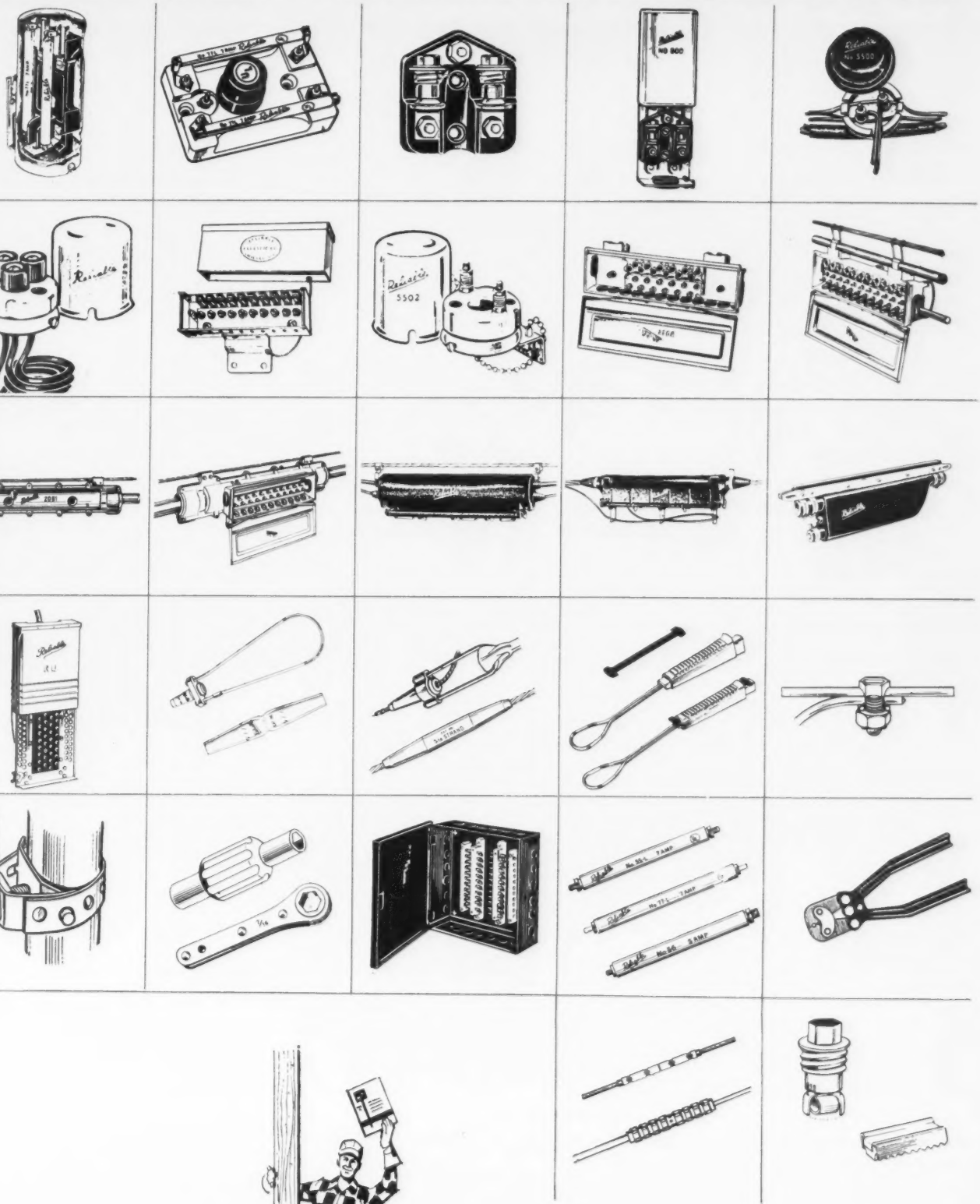

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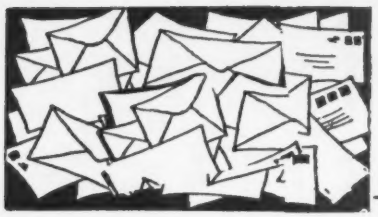

LETTERS to the editor

"It's On The Way"

TO THE EDITOR: — "In the April 1 issue of *Telephone Engineer & Management* Allan Stacey made reference to the Telephone Advertising Institute in his article on bill stuffers. I would appreciate receiving further information as to the services of the Telephone Advertising Institute which may be available to us."

R. B. Barnard,
Personnel Officer,
Northern Telephone Co., Ltd.,
New Liskeard, Ontario, Canada.

"4,200 Reprints Made"

TO THE EDITOR: — "Here are four copies of our reprint of the editorial 'The New Competition' which appeared in the April 15, 1960 issue of *Telephone Engineer & Management.* We have made 4,200 reprints of this article."

M. E. Reames,
General Personnel
Training Supervisor,
The Mountain States Telephone & Telegraph Co.,
931 14*th St.,*
Denver 2, Colo.

"We're Pleased With Your Plan"

TO THE EDITOR: — "Enclosed you will find a press release describing the National Inventions and New Products Conference & Exhibition. Our telephone answering and message recording system has been selected as one of the exhibits.

"I would like to use, as part of our exhibit, a photostat enlargement (9½" x 24") of the press release and illustration which you were kind enough to print in the April 15 issue of *Telephone Engineer & Management.* Naturally, a credit line showing the source as TE&M will be an integral and important part of the photostat. May I have your permission to do so?"

Emmett R. Salzberg,
514 *W.* 110 *St.,*
New York 25, *N. Y.*

"Hope They'll Be Helpful"

TO THE EDITOR: — "We would appreciate your sending us two copies of the following article from the May 15, 1960 issue of *Telephone Engineer & Management*: 'Coordination of Carrier and Inter-Toll Switching Equipment'."

C. L. Coghill,
Technical Writer,
U. S. Instrument Corp.,
P. O. Box 1191,
Charlottesville, Va.

"Slugs in the Coin Box"

TO THE EDITOR: — "Thank you for your interesting paper on 'Slugs In The Coin Box' which appeared in the July issue of *Telephone Engineer & Management.*

"We have also had pay phones ripped off a wall and would ask if you know of any foolproof method of attaching instruments to a wall.

"If available we would appreciate a print for the anti-slug ejector for pay phones manufactured prior to 1950 and after 1950."

H. Parker,
Purchasing Agent,
Northern Telephone Ltd.,
New Liskeard, Ontario, Canada.

"Reprints Wanted"

TO THE EDITOR: — "I have read Mr. Ehinger's four articles on VNL with great interest and appreciation. I wonder if this set of articles might be available as a reprint. They are a mighty fine short statement of details which everyone in the technical end of the telephone business must run into. I would like to have reprints to hand around 'where they would do the most good'."

Theodore R. Cook,
Transmission Engineering,
Pacific Telephone — Northwest,
Portland 4, *Ore.*

Reprints are now available at 50¢ *each. Order from TE&M's Educational Division. See order blank on page* 48. — *Ed.*

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Now . . . security against even momentary outages during power-disrupting storms. Collins' dc-powered Microwave and Carrier Systems operate directly from float-charged batteries — eliminating rotating machinery. The results: improved reliability, reduced power drain, lower maintenance, decreased noise and elimination of standby generators. Several voltage combinations are available, enabling you to select the one that best integrates with your existing plant. For technical literature, write Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

See the Collins 11-15 kmc system with dc power at Room No.661A, USITA Convention, Chicago, Illinois, Oct. 9-12.

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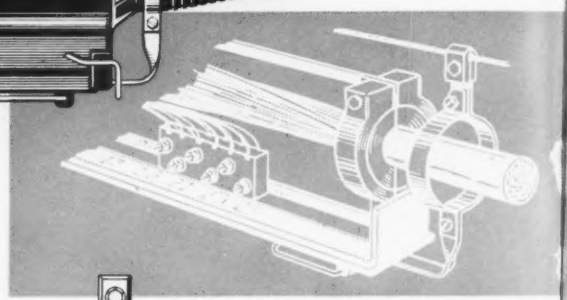
Offers

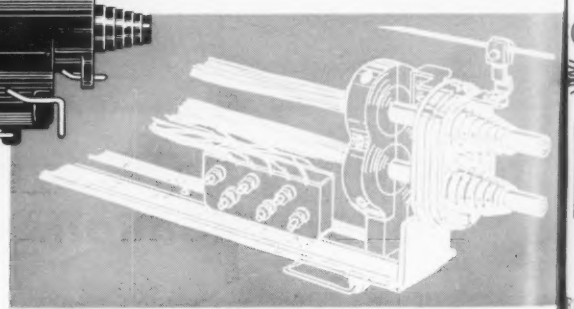
The most complete line of TERMINAL-SPLICE ENCLOSURES FOR PLASTIC CABLE

These versatile, neoprene enclosures are for use on plastic sheathed aerial cable to provide weather tight covers for cable splices, termination, protection equipment and encapsulated loading coils.

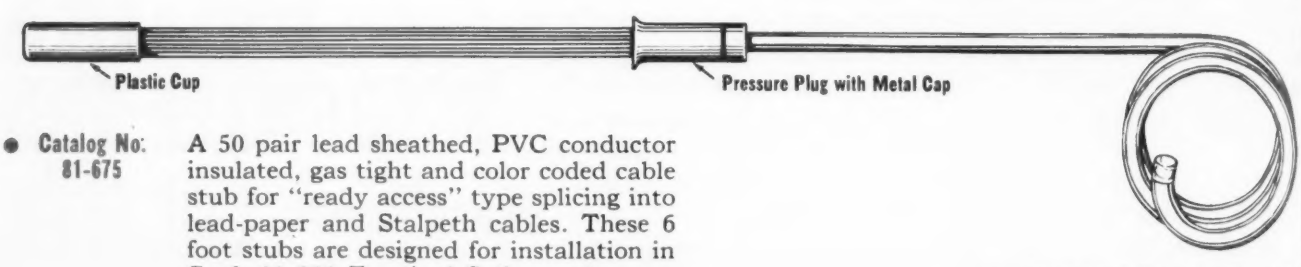
They feature easy accessibility, straight through and branch splicing, and are easily re-opened for re-arranging drops or for maintenance operations



- **Catalog No. 81-250** — A heavy duty enclosure 28 inches long for plastic cables from 1 inch to 2.2 inches in diameter. The unit is furnished complete with all the necessary hardware.

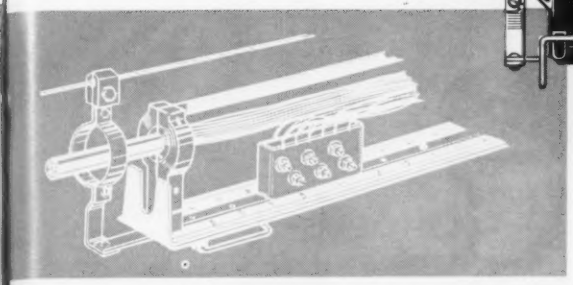


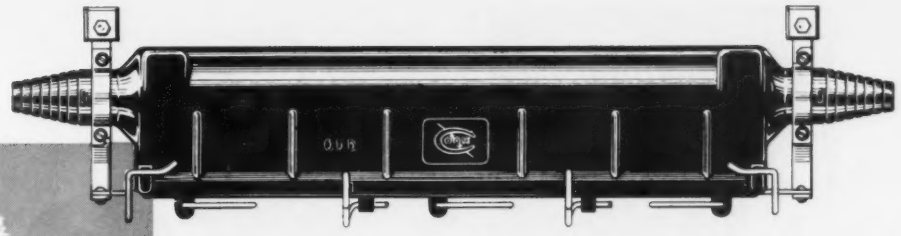
- **Catalog Nos. 81-417 81-418** — These units measure 25 inches in length and are also heavy duty enclosures. 81-417 is for main and branch cables .5 inch to 1 inch diameter, and 81-418 is for 1 inch to 2.2 inch plastic cable diameters.



- **Catalog No. 81-675** — A 50 pair lead sheathed, PVC conductor insulated, gas tight and color coded cable stub for "ready access" type splicing into lead-paper and Stalpeth cables. These 6 foot stubs are designed for installation in Cook 81-565 Terminal Splice enclosures.

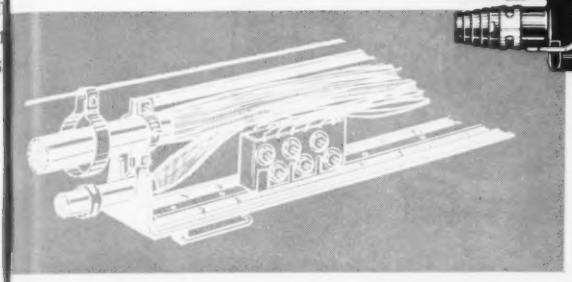
- **Available Through Your Local Distribu**

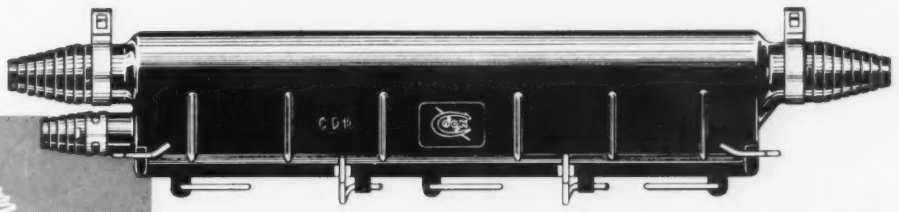




● Catalog No. 81-565

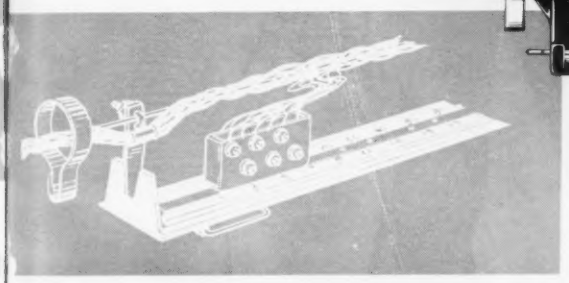
FOR PLASTIC CABLES .5 INCH TO 1.2 INCHES IN DIAMETER. This unique terminal splice enclosure measures 24 inches in length and is equipped with heavy duty hardware. A popular unit with economy-wise buyers.

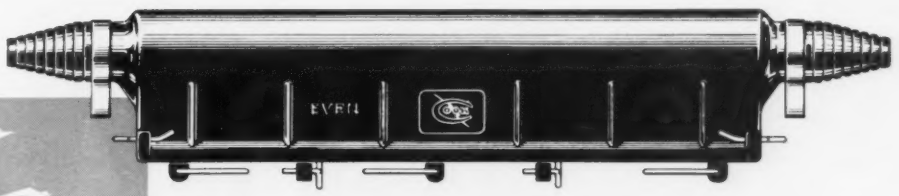




● Catalog No. 81-99

LOWEST COST WYE BRANCH FACILITY. This outstanding Cook Cable Coat will take plastic through cables from .5 inch to 1.2 inches in diameter and wye branch cables up to .875 inch diameters.





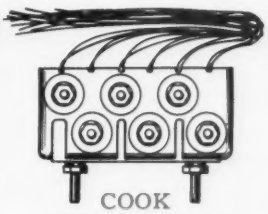
● Catalog No. 81-158

A unique terminal splice enclosure for rural, urban and suburban distribution wires. The unit is designed to take 6, 12, 18, or 25 pairs and has all the advantages of the cable enclosures.

OOK ALSO OFFERS A FULL LINE OF TERMINALS AND LOADING COILS

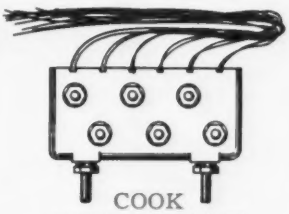
COOK PROTECTED ERMINAL BLOCKS

urnished in 3, 6, and 6 pair with 41-285 Minigap .005″ gap or 1-610 Minigap .010″ ap.



COOK WASHER-GAP TERMINAL BLOCKS

A 6 pair protected terminal block that can be ordered with or without leads.



COOK UNPROTECTED TERMINAL BLOCKS

A 6 pair unprotected terminal furnished with or without leads.

COOK LOADING COILS

Hi-Fi loading coils. Furnished in 1 to 25 coil sizes, with REA approved color coded leads.

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Graybar, too, is an independent business enterprise

When a youngster instinctively takes a personal interest in his customers, he's on his way to business success. So it is with a "grown-up" company, such as Graybar. Because, being independently owned and operated — like the telephone companies we serve — Graybar *knows* and has always stressed the importance of extra, *personal* services.

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INDUSTRY VIEWS

Hartford, Conn., is just 14 digits away as WILLIAM MENGES, Hanover burgess, places first DDD call to his daughter. S. L. SMITH, left, Hanover district manager for United, watches while MR. MENGES'S granddaughter, HELEN, listens in.

BURT RUFFNER, general plant manager for General Telephone Co. of Michigan, has been elected to the Advisory Committee of the Public Utilities Executives' Conference. Ruffner won the post at the annual international program sponsored by the University of Michigan's School of Business Administration. He will serve a three year term on a 12 man committee, replacing J. T. Kreamer, operating vice president for United Telephone Co. of Kansas, whose term expires this year. The conference, attended by 63 telephone executives from the U. S. and foreign countries, concluded July 15.

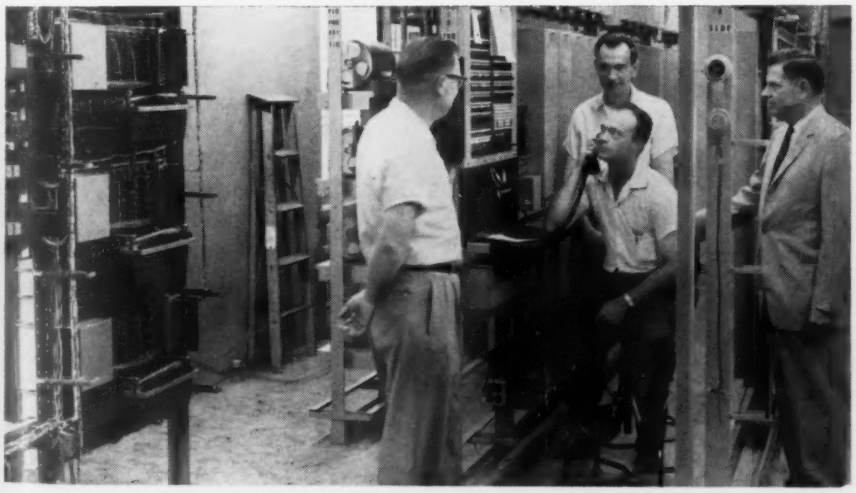
Directors of the Pennsylvania Independent Telephone Association — (front row, l. to r.) J. H. SWOPE, H. Y. SMITH, G. M. KEEFER, B. V. COBLER, W. M. GOTTSCHALL, and A. J. SORDONI, JR.; (second row, l. to r.) A. C. HERBERT, C. A. RUHL, A. C. GLICK, R. B. SCOTT, L. R. THURSTON, A. N. SEWARD, H. G. PAYNE, and L. F. SHEPHERD. K. B. Schotte was not present when photograph was taken.

Members of the Texas Chapter of the Independent Telephone Pioneer Association recently attended a 3-day meeting at the Baker Hotel, Mineral Wells. Shown above are (standing, l. to r.): JIM LUTHER; ALLEN URSCHELL and son; RECIE EAKIN; ERA LOWRY; WALLY JOHNSON; MRS. WALLY JOHNSON; G. D. FORCE; MRS. G. D. FORCE; MRS. MORRIS BATEMAN; MORRIS BATEMAN; MRS. MARION CLAY; F. A. ROBINETTE; MARION CLAY (president, Texas Telephone Association); (Seated, l. to r.): MISS URSCHELL; MRS. ALLEN URSCHELL; LEWIS GROSS; HOWARD HOUSLEY (program chairman); MRS. JIM LUTHER; MRS. LEWIS GROSS; MRS. F. A. ROBINETTE; MRS. HOWARD HOUSLEY; and WINNIE B. BURNETT. Also attending but not pictured, J. B. Haley, executive secretary of the Texas Telephone Association.

USITA Vice Pres. FRANK G. LaPRADE, pres. of Lee Tel. Co., Martinsville, Va., addressing the 1960 convention of the Pennsylvania Independent Telephone Association.

WILLIAM J. McCLUSKY, pres. Citizens Telephone Co., Rock Creek, Ohio, places the first call to Wilton, Connecticut, as he inaugurates new $100,000 direct dialing system.

MAJOR GENERAL JAMES DREYFUS, director, communications-electronics, Department of Defense, Washington, D. C., addresses 1960 convention of the Pennsylvania Independent Telephone Association.



Final preparations for the cutover to Strowger Automatic Toll Ticketing (SATT) equipment are made at Illinois Consolidated Telephone Co. of Mattoon. From left are ROBERT STOLL, Automatic Electric Co. staff engineer; ROBERT STEVENSON (seated), Illinois Consolidated Telephone central office maintenance man; WILLIAM DUNBAR, AE installation foreman; and A. A. WILSON, chief engineer of the Illinois Consolidated Telephone Co.

J. C. BLANTON has been promoted to regional vice president of the A. B. Chance Co. Blanton has charge of sales and warehousing operations in the North Central region with headquarters in Chicago.

ANACONDA'S TRUE-COLOR CONDUCTORS MEAN EASY INSTALLATION

Full color coding is the biggest single reason why Anaconda Alpeth cuts down your installation costs and time. Splicing by color eliminates the use of test picks for electrical identification of pairs and subsequent troubles resulting from the test pinholes. Terminations are quick and easy, all it takes is a one-man crew.

Every time you alter existing or add new cable property, you get every low-cost installation advantage over and over again.

You get many long-range advantages too.

Anaconda Alpeth Cable has a high-molecular-weight polyethylene jacket which is highly resistant to abrasion, weathering, moisture, lightning damage, and environmental cracking. It also gives you protection against sheath fractures at support points.

High-molecular-weight PE is used also to insulate the individual conductors. This material is an excellent moisture barrier and its use minimizes failures caused by water vapor.

Find out more about the advantages of Anaconda Alpeth. Call your nearest Anaconda district office. Or write: The Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

6012A6

In Butler, Pennsylvania, this People's Telephone Company lineman finds it easy to identify Anaconda's true-color pairs even in poor light.

PHONE THE MAN FROM

ANACONDA®

FOR ANACONDA ALPETH

The independent telephone cable manufacturer for the independent telephone industry.

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means more
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Kellogg-K-1A1

In all 50 states, Main Streets are humming with activity—the kind that means *extra* revenue for alert telephone management. For today, busy people need a "stepped-up" telephone system—a multiple-service unit which increases efficiency and reduces overhead.

Kellogg's K-1A1 Key Telephone System offers every business, large and small, the cost-cutting, streamlined advantages of a multiple key telephone installation. A simple on-the-spot demonstration graphically illustrates its time and money-saving features.

K-1A1 is a system business men instantly recognize and accept . . . with all the features they want and need.

For independents, K-1A1 is another quality Kellogg instrument, tops in its field, that means extra revenue for you month after month.

Ask your Kellogg representative to give you all the details.

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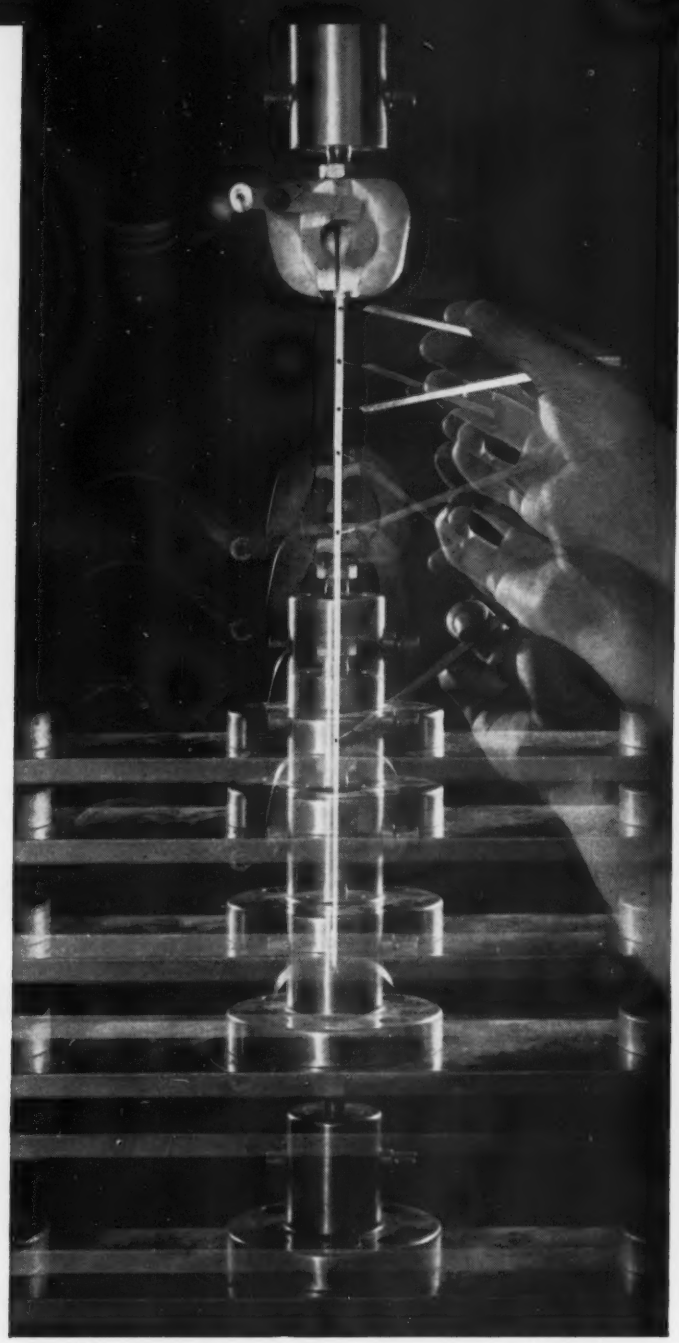

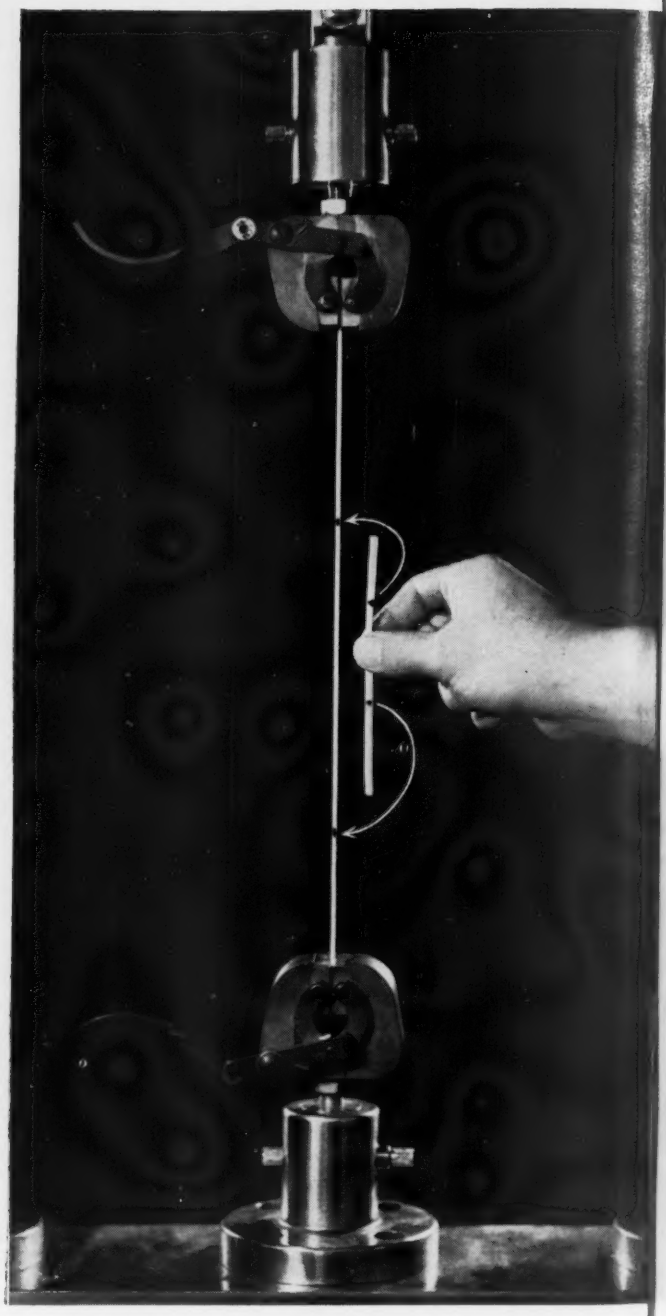

These photographs show Opalon 1040 insulation, after aging 7 days @ 121°C., being stretched over 2½ times—a retention of 92% elongation of unaged material!

After aging 7 days at 121°C., OPALON® 1040 vinyl insulation retains 92% elongation!

Opalon 1040—UL-approved compound for THW* insulation and jacketing—provides a wide margin of safety in passing UL specifications. These photographs graphically show how. In elongation and retention of elongation after aging—*the major areas where failure may occur*—new 1040 is outstanding.

With a fine balance of electrical and physical properties, and processing characteristics, Opalon 1040 is highly useful for insulation and jacketing for building wire, and jacketing for communication and distribution wire. Its excellent moisture-resistance produces jacketing and insulation that protects against conductor corrosion and oxidation under extreme moisture conditions.

Write for complete technical and processing data on Opalon 1040, to Monsanto Chemical Company, Plastics Division, Room 760, Springfield 2, Mass.

*Under the THW classification, up to 20% more current can be run through conductors than could be with TW conductors. Smaller conductors can be used, saving conduit space, cutting wiring costs. Maximum operating temperatures raised from 60° to 75°C.

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LINE WIRE, STRAND, GROUND RODS, DROP WIRE, INSULATOR TIES

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These National Telephone Distributors carry stocks of Copperweld Products at locations shown on map.

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- (B) BUCKEYE TELEPHONE
- (G) GRAYBAR ELECTRIC
- (K) KELLOGG SWITCHBOARD
- (L) LEICH SALES
- (S) STROMBERG-CARLSON

And supplementing these stocks—

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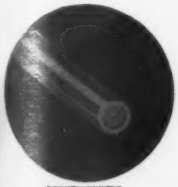
Call Your Copperweld Distributor for immediate delivery

Wherever you are, the fastest, most dependable way to get Copperweld Telephone Products—the best materials for your outside plant—is to contact the Copperweld Distributor in your area. He has large warehouse stocks on hand for immediate delivery and you'll find his service convenient. Important, too, is the cooperation you'll get from his people. They're all part of a team working for you.

Place your order now with your Copperweld Distributor. He's ready to show you real service.

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION *Glassport, Pa.*
For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York


LINE WIRE

GUY AND MESSENGER STRAND

DROP WIRE

GRIP-FLEX INSULATOR TIES

GROUND RODS AND CLAMPS

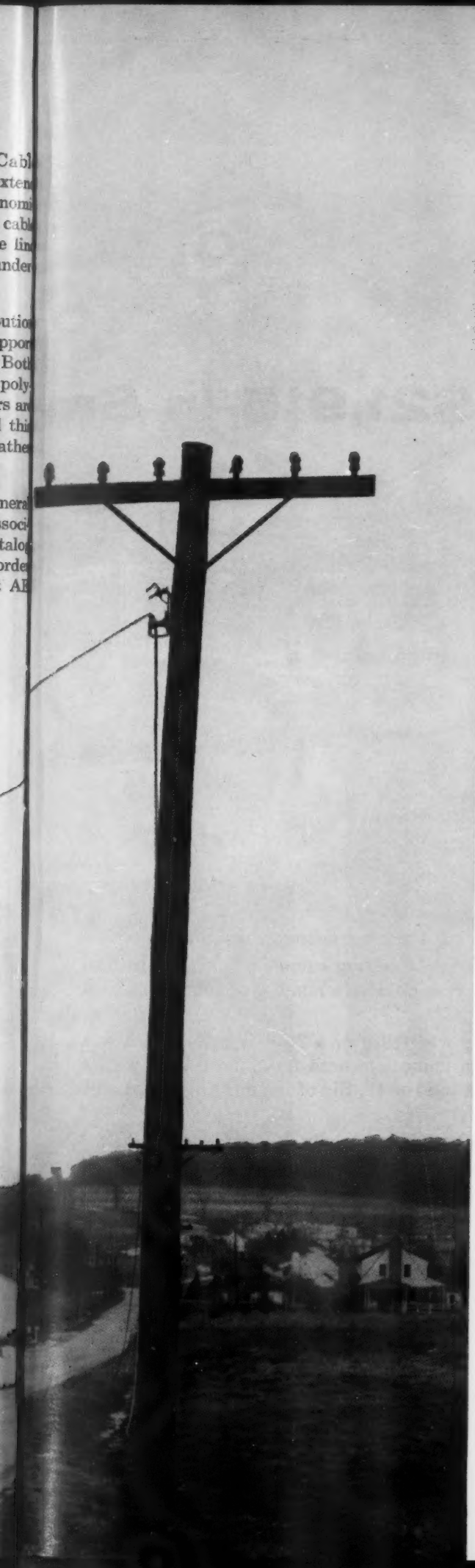
add more circuits fast, meet growing needs quick

with General Cable Distribution Wire and Cable

Rapid, low-cost installation! With General Cable Multi-Pair Distribution Wire and Cable you extend open wire lines or cable plant quickly and economically. On new construction you attach this cable directly to the pole. To increase existing pole line capacity, you simply attach this cable to the underside of a crossarm or directly to the pole.

Built to last! General Cable Multi-Pair Distribution Wire and Cable is really durable. The steel support wire has a breaking strength of 1800 or 2700 lbs. Both the support wire and the copper conductors are polyethylene insulated. What's more, the conductors are protected by a polyvinyl chloride jacket. And this jacket is fully color-coded. So, you get all-weather protection and fast identification.

Easy to order! AE stocks various sizes of General Cable Distribution Wire and Cable (plus the associated hardware) in all its warehouses. Use the catalog offered at right for ordering information. Then order from your AE representative or your nearest AE Sales Corporation warehouse.



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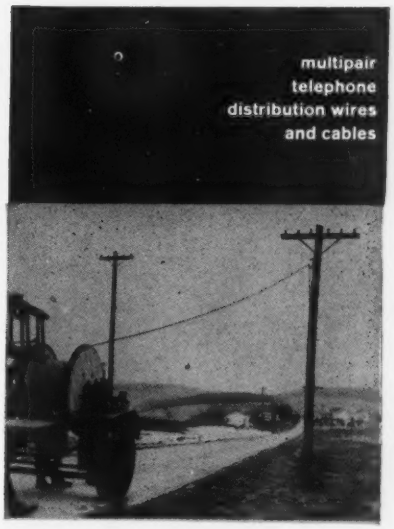
NEW GENERAL CABLE CATALOG

You'll find full ordering information on Multi-Pair Distribution Wire and Cable in General Cable's new catalog. Ask your AE representative for a copy or write: *Automatic Electric Sales Corporation, Northlake, Illinois.*



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PROFITABLE USES

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Imagine! A unit that saved $21,915 while serving a small growing community.

That's exactly what Leich's Line Concentrator did by cutting outside plant costs. Instead of serving each line over a separate wire pair, it concentrates a number of subscriber lines over a much smaller "high usage" trunk group.

The cost-cutting story: This small community was fed over a 26 pair cable which was working at 100 per cent capacity. There was an immediate need for 8 more lines with a projected 15 year ultimate of 10 more lines for a total of 18. Six of the existing lines and 7 of the new lines required long line adapters.

The cost estimate for an additional 26 pair, 19 gauge cable plus loading was $30,000.

The cost of the Line Concentrator plus weatherproof cabinet and installation labor was $4,785. In addition, it was necessary to move the distribution point of the Concentrator's subscriber unit back toward the central office to get within trunk limits for Concentrator operation. The cost was an additional $3,700 for a total of $8,485.

This figure was reduced to a net cost of $8,085 by applying long line adapters to the 9 Concentrator trunks rather than 13 long lines.

Savings from use of the Concentrator: $21,915!

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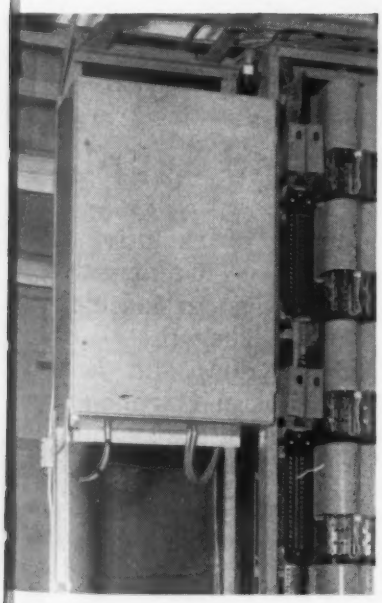

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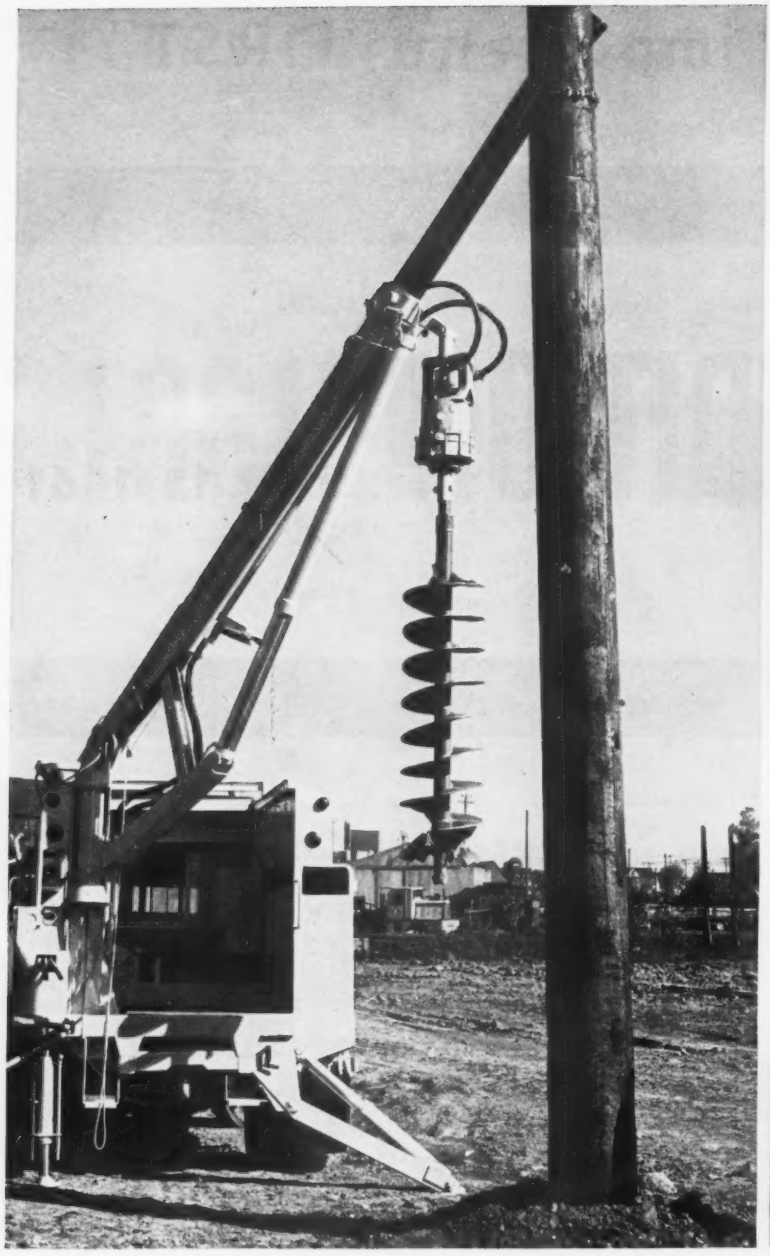
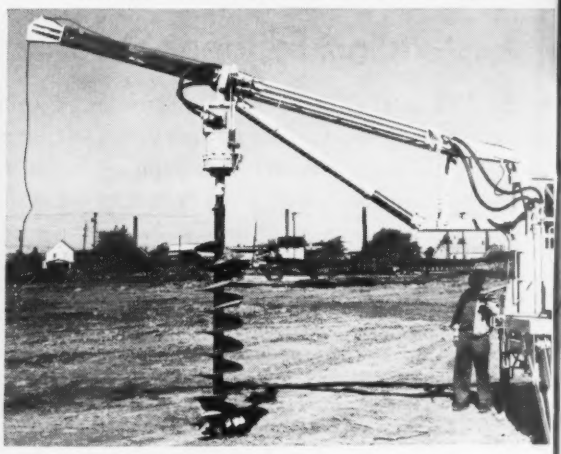


Semi-automatic device locks borer on end of extendible boom for digging.

Borer automatically locks to end of main boom when retracted, leaving extendible boom free for pole setting.



Diagnosis: High Feed Pressure

Strongest corner-mounted derrick in the field is Holan's 7500 — a powerful, time-saving derrick that operates in an arc behind and to the right side of the truck.

Here's power . . . real power . . . all the up and down feed pressure needed to drive any derrick-suspended digger. And more than that, it's the only corner-mounted derrick built capable of handling Holan's rugged 3-speed 5400 Earth Borer.

Jobs can go ahead on schedule — even in alleys, narrow streets and congested areas because positioning problems are ended. Parked parallel to the curb, the 7500 swings over . . . even over fences and guard rails . . . reaches out . . . and digs deep holes, sets poles up to 70 feet in length.

The 7500 is engineered as a complete unit to avoid body and derrick stresses . . . can "live boom" 8,500 pounds, winch 10,000 pounds.

A semi-automatic locking device moves the earth borer onto the extendible boom for digging . . . or to its main boom storage position.

The 7500 . . . shown here mounted on the left side . . . is available mounted on the right side. It reaches up 27'-6", 18½' behind the truck, and beyond the right side 12'-3" (left-side mount) and 16'-10" (right-side mount) with boom extended.

Before you buy any corner-mounted derrick, write us — or call your Holan Field Representative — for complete details.

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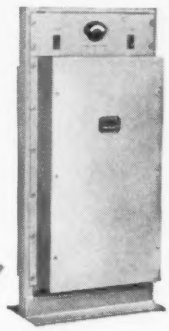
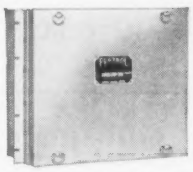
When planning for the future...
...look to the past

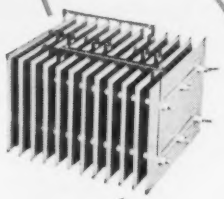


FLOTROL BATTERY CHARGERS

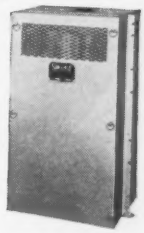


CARRIER SUPPLY UNITS

BAT-TAP D-C VOLTAGE REDUCERS



DRY CEMF CELLS



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Today's telephone plant installation must give trouble-free service to the coming generation. Plan for the future with the help of Lorain... join our many satisfied customers whose Lorain equipment has already withstood the test of time.

The line of power equipment developed and manufactured by Lorain is the most complete in the telephone industry. 40 models of Sub-Cycle Ringing Converters, 550 models of Flotrol Battery Chargers, 43 models of Power Supply Units, 13 models of Tone Generators, 48 models of CEMF Cells.

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THE 5,009 members of the Independent telephone industry who proudly wear the industry's true badge of honor — the emblem of the Independent Telephone Pioneer Association (ITPA) — *cordially invite your company to become an associate member of the Pioneer organization.*

This invitation is extended to all *Independent telephone companies* and *manufacturing, supply or service companies* serving the telephone industry.

An Associate Membership in the Independent Telephone Pioneer Association joins your company with the veteran members of the industry — a group whose members have contributed much to the progress of the telephone industry and helped to produce today's modern communications systems.

Although exclusive and coveted, membership in the Independent Telephone Pioneer Association is not restricted to any special group.

Your company can give its support to the aims and goals of the Pioneer group by joining the ITPA as an Associate Member today.

Your company's application for an Associate Membership in the ITPA will receive the prompt attention of the ITPA Membership Committee.

PLEASE COMPLETE APPLICATION AND MAIL TODAY

Independent Telephone Pioneer Association

1037 S. 4th St., Springfield, Illinois

APPLICATION FOR ASSOCIATE MEMBERSHIP

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TYPE OF BUSINESS _____

HEADQUARTERS _____

MAILING ADDRESS _____

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(Established by Associate Member — $5.00 to $50.00 Annually)

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Application subject to approval of Membership Committee

TE&M 9-15-60

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WILKINSON PRODUCTS COMPANY

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MINIATURIZED PRECISION
WILKINSON LINE LOCATOR Model W-3

A radically new, advanced design in electronic locators for all sub-surface installations — transmissions and distribution lines, cables, valve boxes, buried structures under ground and in walls.

True miniaturization has been made possible by use of transistors, subminiature batteries, components, etched circuitry and transistorized single ear set.

GENERAL SPECIFICATIONS

Size: Receiver — 8″ x 3½″ x 2½″. Transmitter 8″ x 3½″ x 2½″. The set also includes a substantial carrying case. The head set is a single ear transistor type.

Weight: 4 lbs. total, including transmitter, receiver and telescopic connecting handle.

Instrument Cases: Molded glass fibre construction.

Power: High gain type, highly sensitive and accurately controlled.

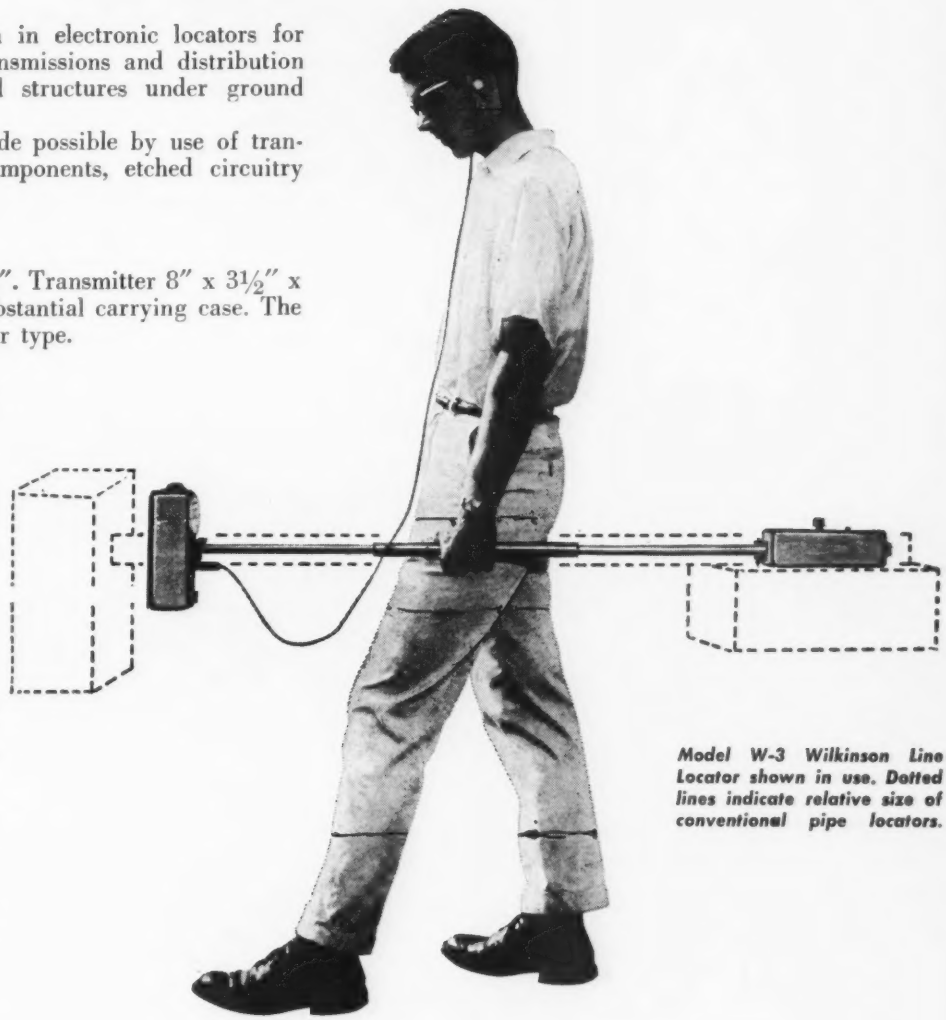
Battery Life: The over-all battery life is ten times that of the conventional locating devices previously available. Mercury "A" cells, non leak miniature size.

Circuitry: The circuits are etched instead of hand wired.

Antennas: New and unique application of miniature "Q"-core antennas.

Shock Resistance: The glass fibre cases, soldered-in transistors, etched circuits and secure mounting of miniature components eliminate the usual hazard of shock common to the previous type locators.

Maintenance: The Wilkinson Line Locator Model W-3 is virtually maintenance-free because of its advanced mechanical and electronic design. The transistors have a rated life of approximately 70,000 hours use. Transistors, resistors and capacitors are soldered into the circuit.



Model W-3 Wilkinson Line Locator shown in use. Dotted lines indicate relative size of conventional pipe locators.

The compactness and light weight of the Wilkinson Line Locator Model W-3 . . . its miniaturization and extremely high sensitivity provide users the ultimate in line locating instruments. It can be used in very close quarters . . . for detecting and tracing cables, pipes and the like in wall installations. Because of its light weight, operators do not experience fatigue. The W-3 functions both inductively and conductively, separated, or assembled on the handle.

Distributors in Principal Cities. Descriptive brochure upon request.

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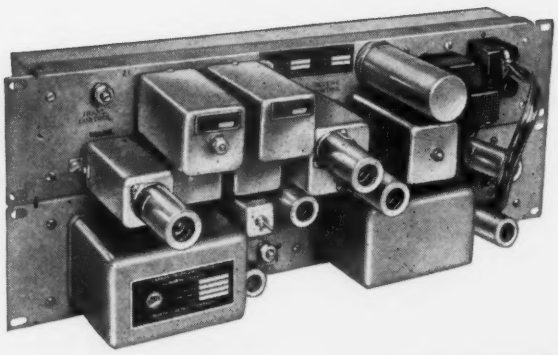

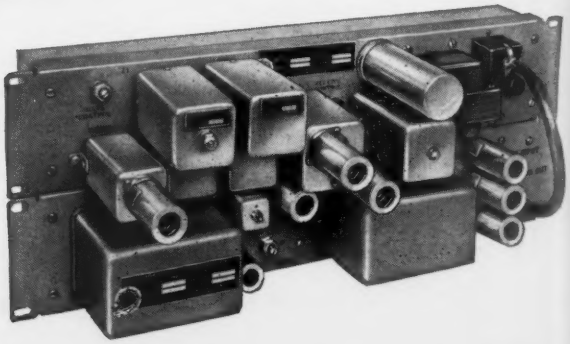

Ad 60-T-13

If the demands for additional trunking facilities and added subscriber service keep you awake nights—if the potential expense of physical line construction has you over a barrel—NOW is the time to talk to your North Field Engineer. He can show you how North Carrier can solve your problems. North Trunk Carrier and North Subscriber Carrier have been designed and built specifically to meet the requirements of the Independent Operating Company.

Low in cost, simpler in circuitry for ease of maintenance, proven-in-use, North Carrier will enable you to extend your service without extending your physical lines.

Cure those headaches now—see your North Field Engineer or write for full details on North Carrier.

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NORTH ELECTRIC COMPANY

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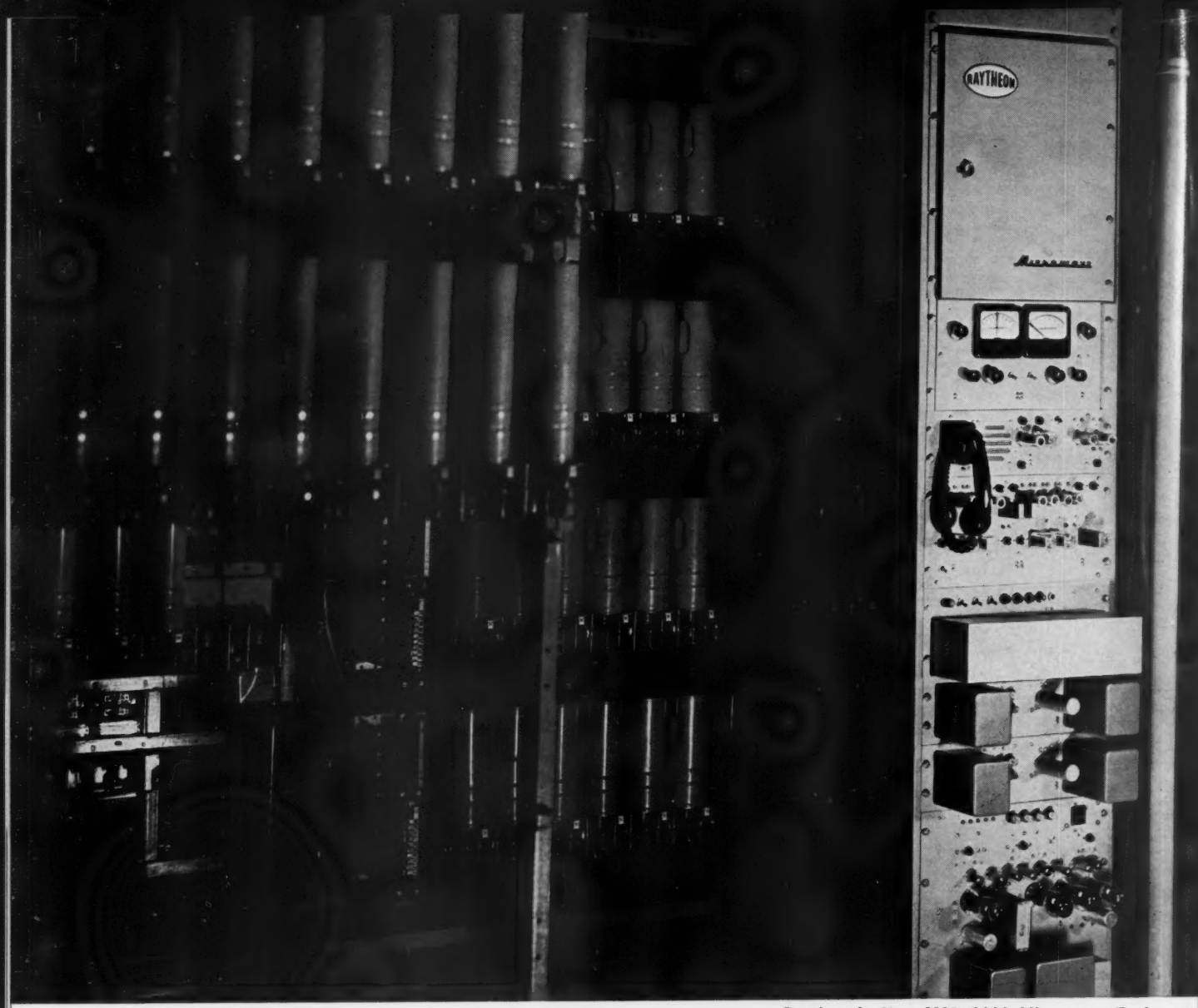

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Now Raytheon offers MCR-1000, a new one-watt output, 240-voice channel microwave system. MCR-1000 features a stable, long-life Klystron; in-socket tube testing; optional battery operation; an advanced design Combiner for frequency diversity; built-in metering and remote fault-alarms.

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EDITORIAL

"New Employe In '45 — Pioneer Today"

A RECENT issue of "*The Independent Pioneer*" served to remind us that 1960 is the 40th Anniversary Year of the Independent Telephone Pioneer Association (ITPA). And that reminder caused us to realize that "Congratulations" are rightfully due to the organization's founder, Mr. J. K. Johnston, the ITPA officers and directors, and members of the ITPA.

This year, as in all the years that have passed since Mr. Johnston founded the Independent Telephone Pioneer Association on June 20, 1920, the organization has lived up to its original dedication — "*deserved recognition to men and women who have served the Independent telephone industry long and well . . .*"

Made up of industry members who have devoted at least 15 years to the task of enabling their fellow citizens, however far apart, to talk instantly with each other, any time of day or night, and, in recent years, with practically anyone anywhere in the world, the Independent Telephone Pioneer Association represents a group whose aim has been, and is, service to the public.

Since the organization was founded it has grown from its original roster of 74 members to 5,009 members. The reason for this growth was expressed some time ago by two Pioneer friends.

One said: "*The Independent Telephone Pioneer Association is the instrumentality whereby recognition can be given for the work the member has performed and the status he has reached . . .*"

The other said: "*. . . with real pride in my business it is only natural therefore that I should have similar pride in my membership and the memberships of our company in the Independent Telephone Pioneer Association . . . We should do our part in perpetuating the Pioneer Association, of which we have every right to be proud, standing as it does for long and faithful service . . .*"

We like the reference to "*recognition for long and faithful service.*" It reminds us that several hundred men and women who started their telephone careers in 1945 have become eligible for membership in the Independent Telephone Pioneer Association.

The industry owes much to the men and women who are now completing their 15th year of service as telephone employes. They, like other industry pioneers, have aided the development and operation of a great system of communication. They have played an important and decisive part in the maintenance and the enhancement of the telephone industry's ideals of outstanding service to the public. They have helped make this reputation for service a tradition of the business.

Also, this new group of industry veterans continued to pioneer and to maintain the industry's record of leadership, not only in technical advances, but of leadership in creating relationships that benefit not only the telephone business but the general welfare of this country.

It is right that the telephone men and women who joined the industry in 1945 should now become eligible for membership in the Independent Telephone Pioneer Association. They have earned this honor, and we urge each industry member who is now observing his or her 15th anniversary as part of the nation's telephone group to become an ITPA member.

Right now the ITPA Membership Committees are in the midst of an all-out campaign for new members — Active, Auxiliary and Associate — and like the committee members we believe it's high time more qualified industry members and companies start sharing in the recognition and benefits gained by membership in the Independent Telephone Pioneer Association.

And this year we hope that several hundred of those telephone men and women who have recently become eligible to join the Independent Telephone Pioneer Association will join and start wearing the *ITPA emblem.*

That's one honor the industry has reserved for those who started their telephone career in 1945 and are the new pioneers of today. If you are a member of that group we feel sure a letter addressed to *Mrs. Mayme Workman, executive secretary, Independent Telephone Pioneer Association,* 1037 *S. 4th St., Springfield, Ill.,* today will bring you an application blank by return mail.

(The foregoing editorial, although copyrighted, may be reprinted in whole or in part without charge provided the publication's name and address are shown on the reprint, four copies of the reprint are filed with this publication, and the editor is advised of number of reprints made. This legend need not appear on the publication.)

By John S. Reed

Progress With The All-Buried Telephone

Important changes in the materials, tools, and technology involved in placing rural and urban telephone lines underground have reduced installation and maintenance costs and increased service reliability. This report on all-buried telephone service is Part One of a two-part article. Reprints of this report will be available (see page 48).

SINCE publication of an article on the subject of the all-buried telephone service concept[1] two years ago, there have been important changes in materials, tools, and technology involved in the placing of rural and urban telephone lines underground. These changes are all in the direction of greater economy in installation procedures and higher reliability of telephone service provided, with the minimum of maintenance.

According to a report by the Engineering Committee of the United States Independent Telephone Association,[2] the following are economic factors that have made it important to seriously consider the placing of buried distribution systems:

(1) The severe damage to aerial telephone plant from hurricanes along the east coast during recent years.

(2) The construction of low ranch type houses, which creates the problem of inadequate clearances for the pole-to-building drop wire spans.

(3) The trend to curving or angular rear property lines, which adds to guying difficulties.

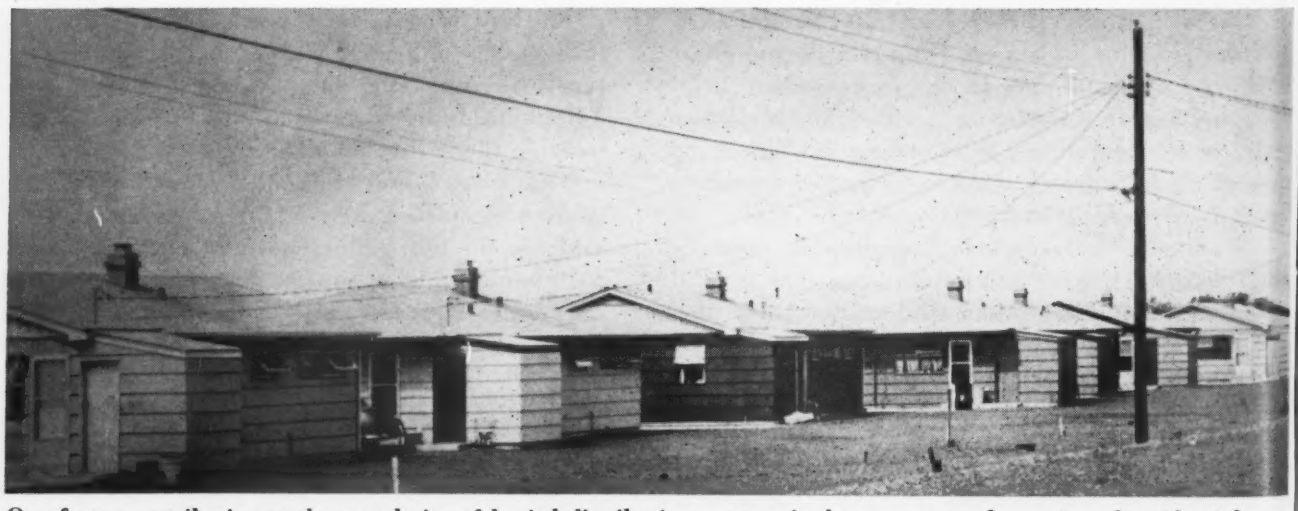
(4) The practice of developers to remove all trees, causing the aerial plant to stand out in an unattractive manner.

Experience with buried distribution systems indicates that the advantages listed in the previous article still hold true. Briefly, these advantages are: simplification of right-of-way problems, reduction of storm damage to the outside plant, elimination of tree trimming (in rural areas), less costly route staking procedures, improved public relations, and greater safety for plant employes and the public.

With the improvements in burying methods the time required to place wires and cables underground has been reduced to the extent that it is now possible to lay these facilities in rural areas at the rate of four or five miles per day with a single plow under average conditions. At least one company reports an average of six miles

[1]—*The All-Buried Telephone Service Concept, Telephone Engineer and Management, April* 15, 1958.

[2]—*U.S.I.T.A. Engineering Committee Bulletin, Section B, Issue No.* 1, *September*, 1959.



One factor contributing to the popularity of buried distribution systems is the tree removal practice of residential area developers that causes aerial plant to stand out in an unattractive manner.

...rvice Concept....

REPRINTS of this Special Report on Buried Telephone Service will be available following publication of Part II. To order your copies use the order blank on page 48.

per day with 10 miles per day being achieved in some cases.

It is only fair to say that there are several inherent disadvantages to the use of buried plant. These are insufficient flexibility for additions and changes of subscribers, compared to aerial plant. More pairs must be provided in buried cables to allow for future possible additions which cannot accurately be foreseen. Buried wire distribution systems must be carefully planned and terminals must be located to anticipate future subscriber connections. If a customer requests service in a location not anticipated in the original plan, it will be more costly to install and require more time to provide the desired service than in the case of aerial plant extensions.

Faults in buried wire and cable are harder to locate and more time is required to repair the damage. Special equipment is needed to trace the path of buried wire or cable, though standard fault locating equipment can be employed to pinpoint the trouble spot. Where plastic-

Next page, please

Buried service is the answer to the problem of inadequate clearances for pole-to-building drop wire spans that has been created by low ranch-type houses.

Sleet damage to aerial telephone plant is another economic factor that is causing telephone companies to seriously consider the installation of buried distribution systems.

The All-Buried Service Concept (continued)

jacketed, plastic insulated conductor (PIC) cable is involved, faults may be especially hard to find because of moisture dispersion along the cable core at a distance from the sheath break.

Transmission losses at voice and carrier frequencies are higher in buried wire and cable because of the smaller conductor sizes and higher capacitance resulting from the close proximity of conductors and pairs and the surrounding metal sheath. Loading is helpful in reducing the capacitive effect, but prevents the use of carrier on the buried wire. Also it is difficult to apply carrier to the buried facilities in a practical and economical way, particularly in the case of subscriber carrier.

Buried cable and wire distribution systems are subject to physical damage by construction operations, particularly those involving grading by highway maintenance forces, road construction work, and trenching by water and gas utility people. Soil erosion may reduce the top cover or uncover the buried plant, increasing the chances of damage to the plant. Where soil erosion and washouts are likely to occur, the wires and cable must be placed to greater depths or rerouted, or aerial plant constructed in the particular area.

In some locations, gopher damage may be a serious cause of trouble unless a heavy metal shield is used on the buried wire or cable. Such metal shielding must be capable of resisting the gnawing of the gophers. Also in locations where severe thunderstorms are frequent and the soil has high resistivity, such as sand, adequate electrical protection against lightning surges is needed.

Costs of placing and operating buried wire and cable

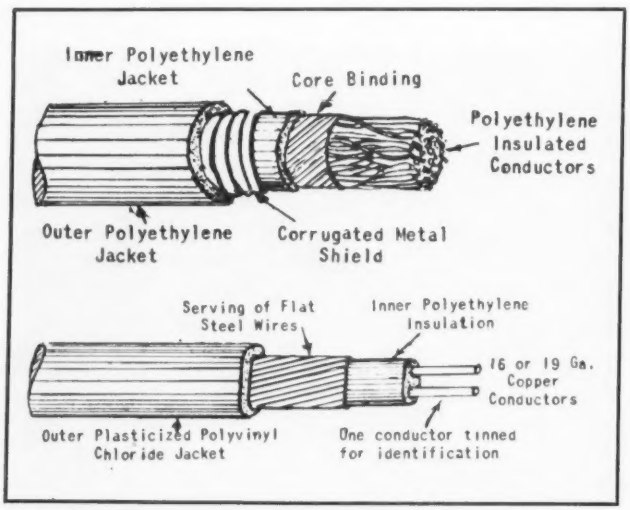


FIG. ONE: — Above — Typical construction of direct burial telephone cable. Below — Construction of buried distribution wire with steel wire armor.

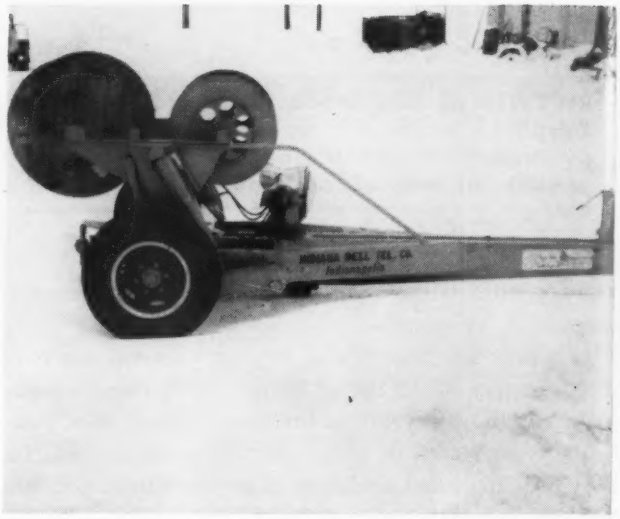


FIG. TWO: — Ryan Model "C" plow equipped with two reel arbors for laying two or more cables or wires at once.

systems have been a bone of contention among telephone groups. The installation cost varies with the kind of soil and the terrain to some extent, but the real stumbling block is plant replacement costs. If the wire plant is badly deteriorated, but many of the poles are still good for years of service, salvaging costs may not justify replacement of the aerial plant with buried facilities.

Generally, it may be said that, if the aerial plant is so badly run down as to be totally worthless, soil conditions and terrain favors the plowing and trenching operations, and the highway and county authorities place no impossible conditions on the burying operations, the costs can be made comparable or even less than aerial plant construction costs. Company reports indicate that, with proper placing precautions and good construction methods, buried plant has been giving satisfactory service to date.

The Rural Electrification Administration has compiled detailed standard route mile costs for various sizes and types of buried wire and cable.[3] This information is up to date as of March, 1959 and is a valuable source of data for estimating costs of setting up a rural buried distribution system.

Preliminary Considerations On Buried Distribution Systems

IT IS desirable that, before much work is done on the design of a buried distribution system, the following

[3]—*REA Telephone Engineering and Construction Manual, Section* 640, *Design of Buried Plant.*

points be investigated to make sure that the design will be practical and economical:

(1) Presence of considerable rock in the soil requiring rerouting, use of aerial sections, or short wire laying depths to avoid increasing the over-all installation cost.

(2) Gopher infestion in the area. This can be determined by contacting the District Agent of the Branch of the Predator and Rodent Control, U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, United States Department of Interior. If this agency is provided with a map of the proposed buried system area, it will be able to provide the desired information on the nearest location of the gopher infestion and its extent. The presence of gophers in the area will call for the use of armored buried wire and special tape shield on buried cable with consequently higher material costs.

(3) Attitude of state and county road authorities to

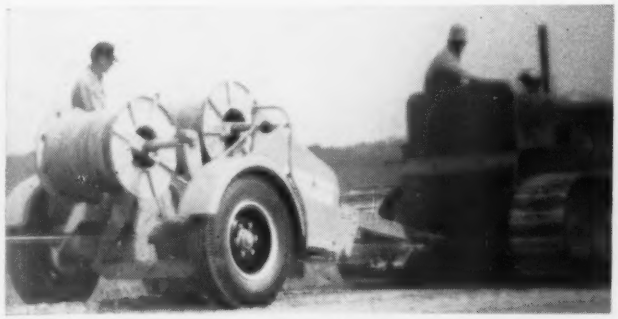


FIG. THREE: — Ryan combination reel trailer with plow and cable laying attachment for laying wire and cable to a maximum of 30″ deep.

FIG. FOUR: — Plowing wire in roadway with plow hauled by two tractors in tandem on cable construction job handled by a contractor.

FIG. FIVE: — John Deere Type .230 cable layer on crawler type tractor designed to lay cables up to 13/16″ diameter at depths of 6″ to 30″.

FIG. SIX: — John Deere cable layer front view showing reel of wire on arbor attached to bulldozer blade. Compact unit may be used in confined spaces in urban areas.

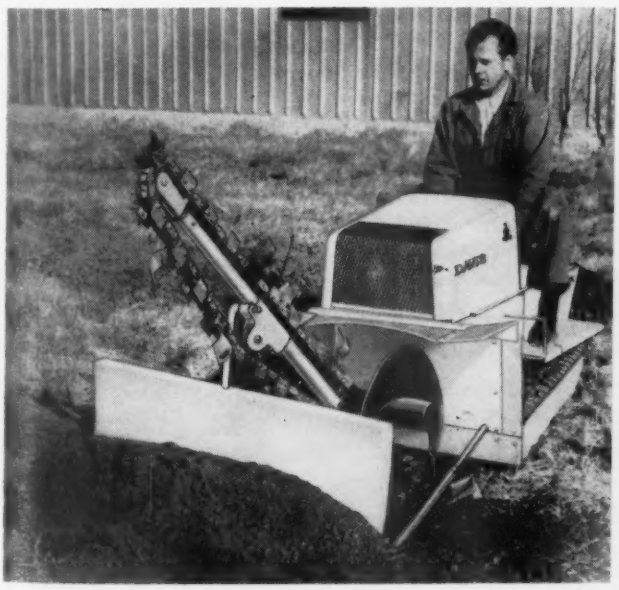


FIG. SEVEN: — T-66 trencher is equipped with its own backfill blade. Digging to 66″ depths is possible in 3 to 4″ widths. (Davis Mfg. Co.)

FIG. EIGHT: — Ryan "Front Lawn" wire plow in use to lay wire from house to terminal. (F. B. Ryan Manufacturing Company)

The All-Buried Service Concept (continued)

the project. Permission of these authorities to bury the wires and cables in public rights-of-way is very essential to the economical installation of the buried plant, particularly when it is necessary to bury the facilities in the roadway or the highway shoulders.

Some state authorities may impose restrictions that must be considered in the initial design. For example they may require tamping of backfill in trenches or slots cut in dirt roads for the wire or cable, which would add considerably to the cost. Most authorities, however, will permit the backfilling of narrow slots by running a tractor tread over the length of the slot in the roadway. In any event, these authorities must be satisfied that any damage to roadways will be adequately repaired.

Road crossings with the plow will be permitted, but paved roads will require the use of pipe pushing apparatus to place the wire or cable under the roadway. This method will also have to be employed in the case of railroad crossings, requiring an agreement with the railroad officials concerned.

There is also the problem of future road improvement and road widening programs. The authorities should be consulted in this regard so that the buried plant may be properly located to avoid moving operations later on.

FIG. NINE: — Ryan wire plow in carrying position. Plow blade is 5/8″ thick and can dig to 18″ depth. It is provided with a 9/16″ stainless steel tube and flexible plastic tube (at top) for passing the wire to the bottom of the trench.

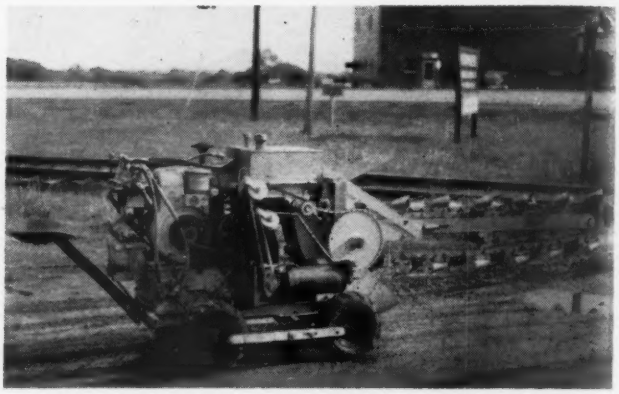


FIG. 10: — Vermeer Model W-3 Pow-R-Ditcher is an 18 horsepower unit for digging trenches 2 1/2″ to 12″ wide to 4 ft. depth. This machine is self-propelled by hydraulic means and is equipped with a dirt conveyor to discharge the dirt to either side. It is available with either rubber tires or crawler tracks.

FIG. 11: — Model 4-7 Pow-R-Ditcher for digging 8″ trenches 4 1/2 ft. deep at speeds of up to 13 ft. per minute. (Vermeer Manufacturing Company)

Wire and Cable For Buried Distribution Systems

THE KIND of cable considered to be best suited for direct burial in soil consists of solid copper conductors with polyethylene insulation, which are bunched into a cable core. The core is covered with an inner jacket of polyethylene of a specified thickness depending on the core diameter (0.04 inch for 5/8 inch core or 0.05 inch for larger cores).

Over the inner jacket is applied a shield of annealed copper. Where the cable is likely to be attacked only by termites or field mice at the most, the shield needs to

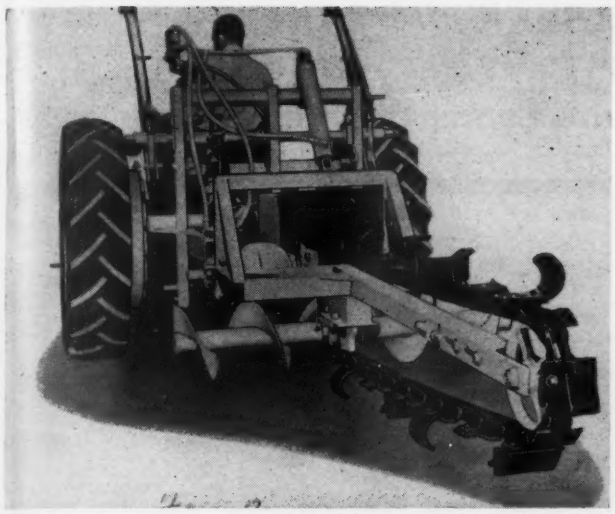


FIG: 12: — Vermeer Model 3-P Pow-R-Ditcher trencher designed to be attached to a tractor and provides a forward travel of the ditcher unit. It obtains power from the tractor's own hydraulic system. The power take-off shaft has a double-disc friction slip clutch for digging safety. (Vermeer Mfg. Co.)

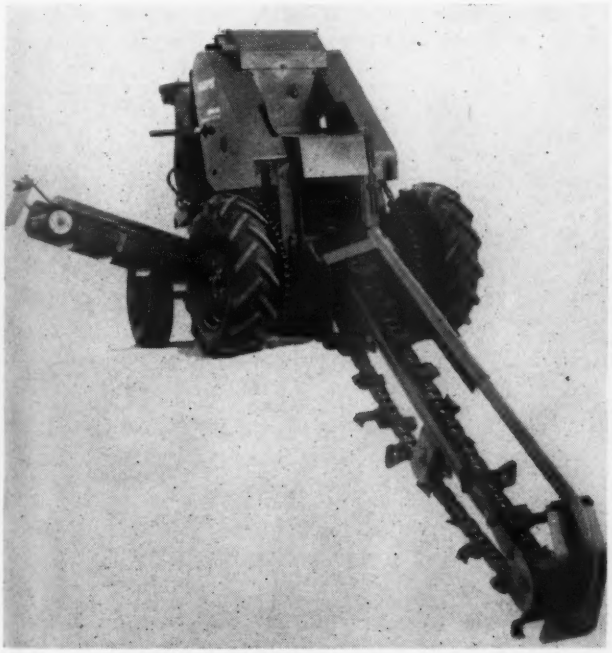


FIG. 13: — ARPS Model MA-2 Trench-Devil unit designed to dig 2 3/4″ to 8″ wide trench up to 4 1/2 ft. deep at digging speeds of 550 ft. per hour for 1 ft. depth and 2 3/4″ width down to 70 feet per hour and 4 1/2 ft. depth. Unit shown has crumber attachment and single wheels. (ARPS Corporation)

be only 0.005 inches thick, but if the cable is to be used in areas of gopher infestion, a shield 0.01 inch thick is required for complete protection.

The shield is corrugated and applied over the cable core longitudinally, being formed around the core and the resulting seam sealed in the process. Afterwards, an outer jacket of polyethylene is extruded over the shielded core. The thickness of the outer jacket depends on the diameter of the cable, varying from 0.04 inch for a core diameter of 3/4 inch to 0.08 inch for core diameter over 2 1/4 inch.

The pairs in the cable are fully color coded, enabling

FIG. 14: — The Auburn trencher is a one-man unit that handles up to 800′ per hour, digs 6″ to 14″ wide down to 6′ deep. (Auburn Machine Works)

FIG. 15: — Parsons Model 77 Trenchliner in use to lay cable. This unit digs trenches 6″ to 18″ wide and up to 5 ft. deep. It has a reversible conveyer to deposit spoil on either side of the trench. (Parsons Company)

FIG. 16: — Front view showing cable going into ditch behind Parsons Model 77 Trenchliner. This unit is less than 6 ft. high and only 3′10″ wide making for compact operation. (Parsons Co.)

The All-Buried Service Concept (continued)

each pair to be distinguished from every other pair, in accordance with a color code system standard with the telephone industry for polyethylene insulated cables. The insulation of each conductor of the pairs in a 25-pair group is color coded as indicated below:

Pair No.	Color Code	
	Tip	Ring (Battery)
1	White	Blue
2	"	Orange
3	"	Green
4	"	Brown
5	"	Slate
6	Red	Blue
7	"	Orange
8	"	Green
9	"	Brown
10	"	Slate
11	Black	Blue
12	"	Orange
13	"	Green
14	"	Brown
15	"	Slate
16	Yellow	Blue
17	"	Orange
18	"	Green
19	"	Brown
20	"	Slate
21	Violet	Blue
22	"	Orange
23	"	Green
24	"	Brown
25	"	Slate

When a cable has more than 25 pairs, individual 25-pair groups are distinguished from one another by color bindings in accordance with the following color code:

25-Pair Group No.	Color Code of Bindings	Group Pair Count
1	White-Blue	1 — 25
2	" Orange	26 — 50
3	" Green	51 — 75
4	" Brown	76 — 100
5	" Slate	101 — 125
6	Red-Blue	126 — 150
7	" Orange	151 — 175
8	" Green	176 — 200
9	" Brown	201 — 225
10	" Slate	226 — 250
11	Black-Blue	251 — 275
12	" Orange	276 — 300
13	" Green	301 — 325
14	" Brown	326 — 350
15	" Slate	351 — 375
16	Yellow-Blue	376 — 400

The bindings may consist of colored threads arranged in color band form, or the bindings may have names of colors and group numbers printed on them rather than be colored.

Buried distribution wire consists of two soft copper conductors 19 gauge or 16 gauge in size laid parallel to each other and having a polyethylene insulation extruded over both. One conductor is tinned and the other is untinned to provide a means of identifying the conductors in the installation procedure. This enables the conductors to be properly transposed at intermediate terminals to properly balance them electrically with respect to the metal shield and thus prevent noise.

FIG. 17: — Model M-3T Ditch-Witch trencher designed to dig 4" wide trenches 4 ft. deep, 6" wide trenches 3 1/2 ft. deep and 8" wide trenches 3 ft. deep at 1 1/2, 3, and 6 ft. per minute. (10 ft. per minute when equipped with high speed sprocket for special jobs.) It has a road speed of 3 miles per hour when traveling on road with digging boom lifted. (Charles Machine Works, Inc.)

FIG. 18: — Model M-3T trencher in operation. This unit has a helical spoils auger to convey dirt to one side of the trench as the digging proceeds.

A shield tape is applied over the insulation. This tape consists of a serving of a number of flat steel wires closely spaced over the insulation in a manner to assure complete protection from rodent and termite damage, as well as to provide an electrical shield. In addition, the steel tape increases the tensile strength of the wire and thus reduces the chance of damage during installation.

Following application of the steel tape, the core is coated with a flooding compound to protect the steel

servings from corrosion and to keep water out of the interstices between the core and the outer jacket later extruded over the core. This outer jacket is plasticized polyvinyl chloride, which provides a tough, flexible covering for the steel serving, as well as for the inner core.

The construction of the buried cable and buried distribution wire is shown in *Figure* 1. Full specifications for these buried facilities as provided by the REA are contained in its Specification PE-23 (telephone cables for direct burial) and PE-24 (buried distribution wire).

The REA Specification PE-23 covers the following conductor gauges and pair numbers of the cable used for direct burial:

Pairs—19 Gauge	Pairs—22 Gauge	Pairs—24 Gauge
6	6	—
12	12	—
18	18	18
25	25	25
50	50	50
75	75	75
100	100	100
	150	150
	200	200
	300	300
	400	400

Other types of cables and wires for direct burial use that are made to other specifications are also available. Thus direct burial wire is available with inner rubber insulation, steel wire serving, and outer neoprene jacket. Another type uses bronze, a shield with inner polyethylene insulation and polyvinyl chloride jacket for use in areas of heavy lightning incidence. For use in locations where a metal shield is not needed buried service wire can be obtained without the shield. A two-pair service wire with aluminum tape shield, polyethylene insulated conductors, and inner and outer jackets of polyvinyl chloride is also available.

Cable for direct burial can also be obtained with standard corrugated or flat aluminum sheath over the inner jacket in pair numbers up to 600 pairs. So-called PAP cable is also available, which has high dielectric strength insulation for use in areas of high lightning exposure. Other types of cable have outside armor and jute covering.

Plowing Depths and Locations For Buried Wires and Cable

THE PLOWING and trenching operations for initially placing a buried wire distribution system can be handled by a contractor. Volume plowing (not less than 100 miles) is needed to obtain a good price. On this basis, it is possible to have the plowing done for four cents a foot for buried wire and four to five cents a foot for buried cable. Contract plowing may not be economical at prices over six cents a foot.

Cable plows for burying wire and cable are generally designed to cut a narrow slot about 1½ inches wide in the soil and at the same time lay the wire or cable

FIG. 19: — Pow-R-Spade trencher for digging 3″ wide trench from 1″ to 24″ deep or 4″ wide trench 18″ deep, at a rate of 1 1/2 to 17 ft. per minute, depending on soil conditions. It is portable and can be loaded and transported by one man to job locations. (Stampings, Inc.)

FIG. 20: — "Go-For-Digger" ditching machine uses the Jeep as basic unit. This trencher digs 6″ to 16″ wide to a depth of 4½ ft. Digging action comes up against the shoe which rides next to the ground. Boom moves over to the side, enables digging along the banks next to the walls or guard posts. Conveyor takes dirt to either side of ditch by hydraulic control at the will of the operator. Front dozer blade with down pressure to make ready and to back-fill. (A. J. Parsons)

FIG. 21: — Bus Brown Model 468R trencher has 12 horsepower engine and provides trenching width of 4 inches and digging depth of up to 6 1/2 feet. Other widths with shallower depths are available. (Brown Manufacturing Company, Inc.)

The All-Buried Service Concept (continued)

at the bottom of the slot. This narrow trench is readily closed at the top by running a tractor or crawler tread over the length of the slot. Rains will later wash down the sides of the trench and eventually the slot will close up more or less completely.

The best location for the plow route to lay the wires and cable is a matter of judgement as to where the buried plant will be least disturbed and where there will be the least number of obstructions to the progress of the plow. On this basis, the following locations would seem to be preferable in the order indicated.[4]

(1) Private right-of-way (adjacent to fence lines or railroad right-of-way usually preferred).

(2) Outside ditch slope on improved county roads and state highways.

(3) Center of travelled portion of unimproved roads.

(4) On the immediate shoulder of the road.

(5) At the bottom of the ditch.

It should be pointed out here that some telephone groups do not consider plowing along a private right-of-way on farm land that is cultivated by power machinery or where there are fences generally economical.[5] There may also be the problem of acquisition costs and the need to clear the right-of-way for the plowing operation.

In the matter of plowing directly in the road bed, some authorities may permit plowing in gravelled or so-called "oiled" roads, as well as in unimproved or dirt roads. If this plowing is properly done, no damage will result to the roadbed.

Where the plowing is done at the side of the road or in the road shoulder, the proper side should be selected to avoid frequent crossings of the road to reach terminals on the other side from the wire route. Also obstacles such as mail boxes and guard rails should be avoided. Laying the wire or cable close to fence posts and trees may result in damage by lightning striking the posts or trees and traveling down them to the buried plant. In spite of the plastic jacket, the inside shield will often provide a good low resistance connection to the surrounding earth. For the same reason, the wire or cable should not be laid near a paralleling pipe line or other metallic underground structures.

FIG. 22: — Bus Brown trencher in operation. It is self-propelled on all four wheels while digging and on rear wheels while transporting. It has a trenching speed of 12 ft. per minute, depending on soil condition. An adjustable auger deposits spoil on both sides of the trench.

FIG. 23: — This hydraulic pipe pusher is excellent for driving conduit under paved roads for buried telephone cable or wire. (Greenlee Tool Company)

As to digging depths for buried plant, the following table[5] represents a good standard for average conditions:

	Buried Cable	Buried Wire	Service Lines
Nominal depth (in soil)	24"	18"	12"
Minimum depth (in soil)	18"	14"	10"
Minimum depth (in roadside ditches)	36"	36"	36"
Minimum depth (in rock)	6"	6"	6"
Minimum depth (at road crossings)	24"	18"	18"

In some cases, the depths indicated in the tables may have to be increased to meet some unusual circumstance, such as, for example, when the land is being subsoiled to a depth of two feet and the farming operations are carried out into the public-right-of-way where the wire or cable has to be buried away from the road or shoulder.

When the wire or cable is to cross the ditch, the

[4] *Buried Plant, Wire, and Cable — Address by E. B. Wheeler, Southwestern Bell Telephone Co., at* 1960 *Texas Telephone Convention.*

[5] *REA Telephone Engineering and Construction Manual, Section* 641, *Construction of Buried Plant.*

trench obviously should be dug to a greater depth than in the road, roadside, or shoulder to avoid damage from road grading operation by highway maintenance crews. If the wire or cable is laid under the bottom of the trench, the minimum depth should be held to 36 inches for the same reason. In fact, even greater depths would be desirable at ditch crossing points if experience indicates a tendency of the highway workers to go deep in ditch cleaning and grading operations.

When the plowing route will be in the ditch slope, nominal digging depths of 18 or 24 inches may be employed, if the slope is well sodded and there is little chance of erosion occurring to require frequent regrading. Generally, however, 30 to 36 inches depth will be safer for the buried plant in this location. Experience has shown that most of the maintenance problems occurring with buried plant result from damage through road maintenance operations.

Plowing and Trenching Equipment

TO PLACE wires and cables underground for a buried distribution system requires plowing and trenching equipment of a rather special sort. The reason is that only a narrow slot is needed to place the wire and most sizes of cable. Wider trenches mean slower operation and more backfilling work afterwards.

Tractor hauled or mounted plows as illustrated in *Figures Two* and *Three* are considered most satisfactory for rural wire and cable placing operations where they can travel along the right-of-way at a relatively rapid rate, with few obstructions to compel by-passing operations. Most trenchers operate best in digging lateral trenches for terminal loops and service wires to houses. The hand type plow shown in *Figures Eight* and *Nine* provides a satisfactory and simple means of digging service line trenches to houses from the terminals when a winch line is available for pulling the plow.

With adequate draw bar pull supplied by a tractor (possibly two in tandem as shown in *Figure Four*) the plow can go through soil containing gravel, small boulders, and thin shale. In case of more rock or heavier shale, a ripper device ahead of the plow may enable the plow to follow in the disturbed earth more easily. The plow can also go through ditches, small creeks, or streams, laying the wire or cable in the process. No special work is needed in these underwater locations.

Plows mounted on crawler tractors as shown in *Figures Five to Seven* are well adapted to two-man operation, with one man driving the tractor and the other helping with the termination work and spading around culverts and other obstructions to place the wire. Such machines are especially useful for line extension work after the plant is initially buried. They can also be used in urban areas for work around houses and in other restricted locations.

Trenchers are used to dig lateral trenches to terminals and service leads to houses in rural, as well as in urban, locations. Trenchers are also used for digging main line trenches in built up areas where cable plows are too large

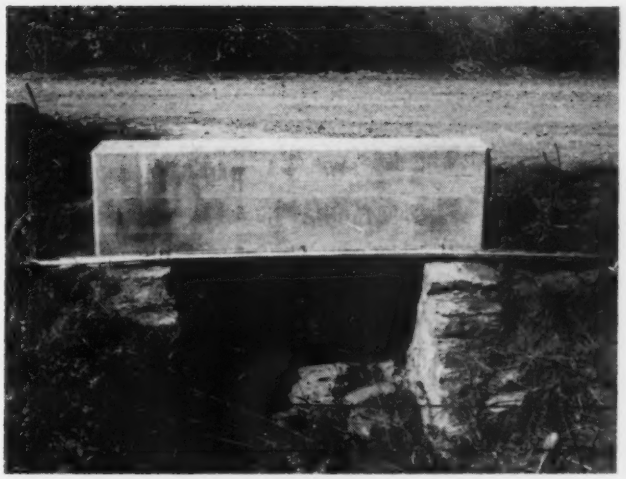


FIG. 24: — Showing use of straight sections of Cablegard split guards to protect buried cable. These straight sections are attached to the culvert abutments with cable clamps and masonry anchors. (Butler Manufacturing Company)

FIG. 25: — Curved and straight sections of Cablegard split guards are assembled to conform to culvert shape as shown.

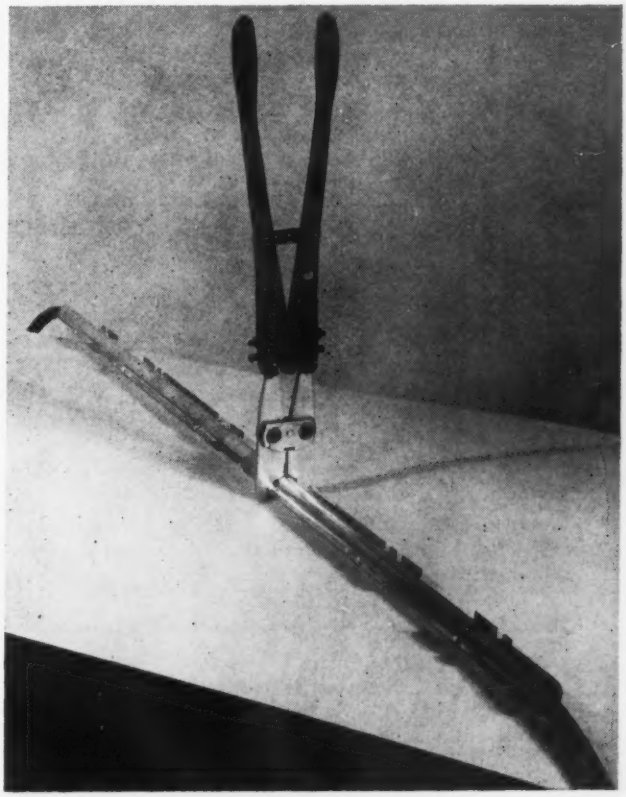


FIG. 26: — Use of Cablegard clamping tool to crimp clips over the flanged portion to form a tight, permanent closure.

A SPECIAL TELEPHONE ENGINEER & MANAGEMENT REPORT

The All-Buried Service Concept (continued)

to operate economically. Various types of trenchers are illustrated in *Figures* 10 *to* 22.

For placing wire or cable under paved streets and railroad embankments, the pipe pushing equipment illustrated in *Figure* 23 provides an economical method of driving conduit pipe to be used in passing the wire or cable.

Mechanical Protection For Buried Wire and Cable

THERE ARE many places along the route of the buried facilities where the wire or cable cannot be laid directly in the ground and must be brought to the surface. In some cases, an aerial construction on poles may be used, but in most situations as at culverts and bridges split metal guards that can be fastened to the bridge and culvert abutments as shown in *Figures* 24 and 25 are the most satisfactory means of adequately protecting the wire or cable. The split guards may be laid in the soil to eliminate the need for trenching in rock and to protect the wire or cable over underground obstructions.

The split guard consists of two galvanized metal halves which are flanged to clamp around a cable. It is presently available in curved or straight lengths of five feet. A simple clamping tool forms a 90° clip after the two halves have been placed around the cable as shown in *Figure* 26. The clamping tool positions the two halves correctly and forces the clip around the flanged portion to form a tight, permanent closure.

Used above or below ground, the split guard is a versatile and easy to use product which will eliminate many cable cuts and resplicing where a solid pipe or conduit type of cover has been used. — *To Be Concluded in the Nov.* 15, 1960, *issue of "Telephone Engineer & Management."*

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"Some companies grow just like 'Topsy,' while others measure for growth."

Measuring For Growth

By Allan R. Stacey

Here is a program which will help you guide your company's growth during the next 10 years, meet service demands, and complete the period with a sound plant and a good financial report.

IN RECENT years much has been written in our trade press about forecasting outside plant growth through using commercial surveys, but little has been said about measuring and forecasting over-all growth of a telephone company. Consequently, I should like to suggest several simple but effective tools which will help in guiding your company's growth in such a manner that you will properly provide telephone service and at the same time come to the end of the next 10 year period in a sound financial and plant condition.

There are four legs to the table which supports a program to grow a sound and solvent telephone company. These legs are: (1) An ultimate land use study; (2) a 10-year growth trend; (3) a five-year construction forecast; and (4) three 12-month moving budgets.

The Four Legs

THE ULTIMATE land use study gives us a picture, admittedly dim and obscure, of what the long, long range operating conditions will be. It's like starting on a journey from New York City to Sitka, Alaska when we have never in our lives been anywhere near Alaska. We must have some idea of what Sitka will be like so that we know whether to plan on using anti-freeze in our car or a plastic coating to prevent tropical fungus from forming on our camera. Likewise, we should like

to know such things as whether our telephone operating area will ultimately most likely require four widely scattered central office buildings or one four-story building at the geographical wire center. An ultimate land use study will give us some clues even if it does not provide final answers.

The 10-year growth trend gives important information regarding the *direction* of our growth. The five-year construction forecast helps us to raise the new money for our expansion. The 12-month moving budgets keep us on the right track now.

Ultimate Land Use

IN ORDER to schedule smoothly the growth of our company it is necessary to make a reasonable estimate of what our operating territory will look like when it is ultimately saturated with subscriber premises. In other words, what will be the operating conditions when we have grown to the limit?

This final stage of our growth can be interpreted either in terms of subscriber units or total population. For purposes of illustration we shall use here the method of quoting final stage operation in terms of subscriber units.

The first step is to consult every person or agency that can be helpful in giving us an idea of what our community is going to look like in its ultimate stage. This would include contacts with such governmental bodies as planning commissions of cities, planning departments of states and other utilities such as gas, water and electricity. To the information obtained from these individuals or organizations, we apply out of our own judgment the factors which will either restrict or stimulate growth. These factors might include future super highways or the community dependance upon a single industry such as gold mining.

The next step is to establish defined areas for study. They may be a whole exchange or part of an exchange. Let us use as an example Area No. 24 in my own company.

Area 24 is basically residential and contains very little manufacturing. Out of discussions with the planning commission we determine that foreseeable zoning practices will give the following types of *land* usage per square mile:

One-family residence	34.2%
Multi-family residence	2.0%
Commercial premises	2.8%
Unusable mountain territory	39.2%
Subdividable vacant area	3.0%
Miscellaneous	18.8%
Total	100.00%

From the electric utility we learn that its expectation is five to seven per cent per year increased KVA demand during the next 10 years. This gives us a clue that in the opinion of the electric utility, family income will be maintained at not less than its present level.

From the gas utility we learn its anticipation of a 40 per cent gain in meters during the next 10 years. This indicates to us that maybe the gas company expects ultimate saturation in 20 to 30 years.

Now, we are ready to develop the ultimate number of premises for Area No. 24. As shown on *Chart One* we determine the number of units for each class of use. For example, you can see on *Chart One* that the one-family units at 34.2 per cent of the four square mile area of Area No. 24, when multiplied by 3,000 units per square mile, gives us 4,104 family units anticipated as the ultimate number of units.

CHART ONE
Ultimate Number of Premises
Portion of Sunland Exchange

	Total Premises
Area No. 24 (Sunland) — four square miles	
One-family units @ 34.2% x 4 mi. x 3,000 units per square mile	4,104
Multi-family units @ 2.0% x 4 mi. x 12,000 units per square mile	960
Commercial units @ 2.8% x 4 mi. x 12,000 units per square mile	1,344
Other units on subdividable land @ 3.0% x 4 mi. x 3,000 units per square mile	3,600
Total Units Sunland	10,008

For multi-family units we expect to have two per cent

Please turn to page 91

"If we are going to reach ultimate saturation in the next 10 years we should be considering that possibility in our present plan making."

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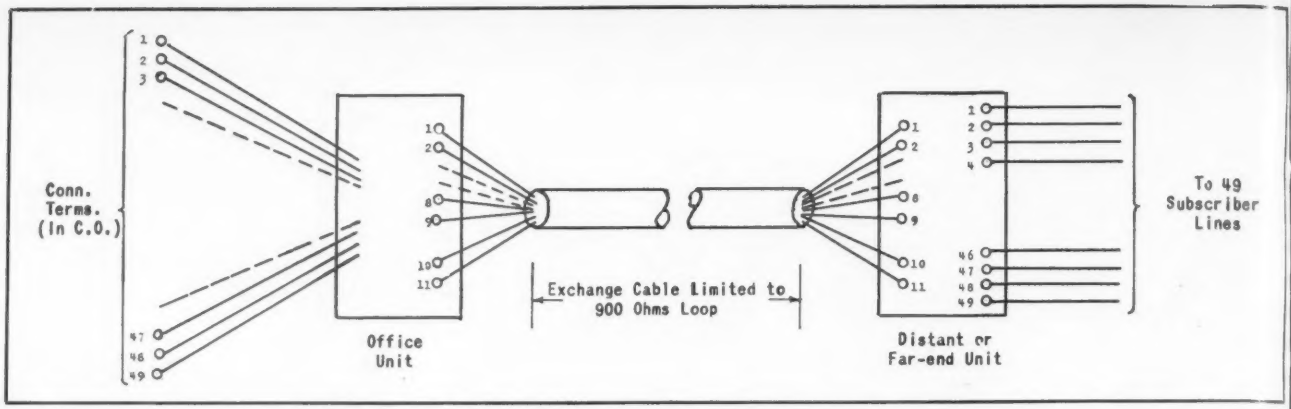

FIG. ONE: — Block diagram of a 49-9-2 line concentrator.

Line Concentrators Aid Expansion Programs

By C. D. EHINGER

IT IS A WELL-KNOWN fact that people in the telephone industry are often in disagreement on the proper ways and means of accomplishing objectives. On the whole, this has been healthy for the industry and has been the cause for many new and different methods. There does appear to be one item in which nearly everyone is in agreement. This concerns the fact that, in the very near future, rapid expansion of plant facilities is going to be urgently necessary. The population explosion, the accelerated movement of residents to "suburbia," the overnight housing developments, the increasing demand of rural patrons for one, two, four party service — all of these factors contribute to the demand for increased plant facilities.

It is one thing to recognize the problem and quite another to work out the proper solution. *Bill Corman*

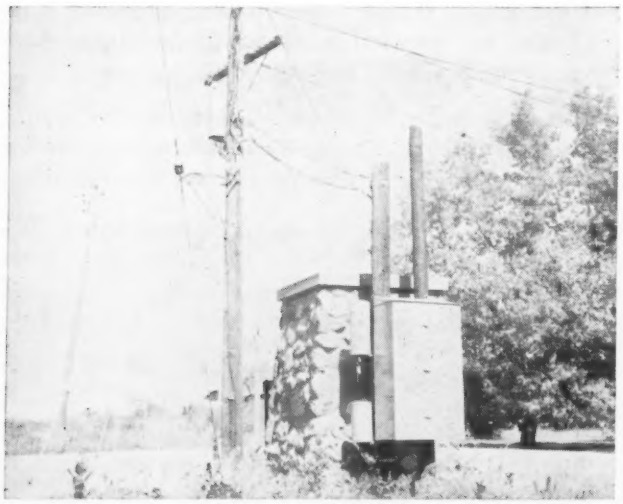

FIG. TWO: — A view of the lake site installation of the Concentrator Unit. A weathertight cabinet houses the equipment and is mounted on a pole with the unit approximately 2 ft. above the ground. Eleven cable pairs, from the central office, are brought into the concentrator unit. A total of 49 subscriber lines can then be distributed around the lake by means of cable, RDW, open wire, etc.

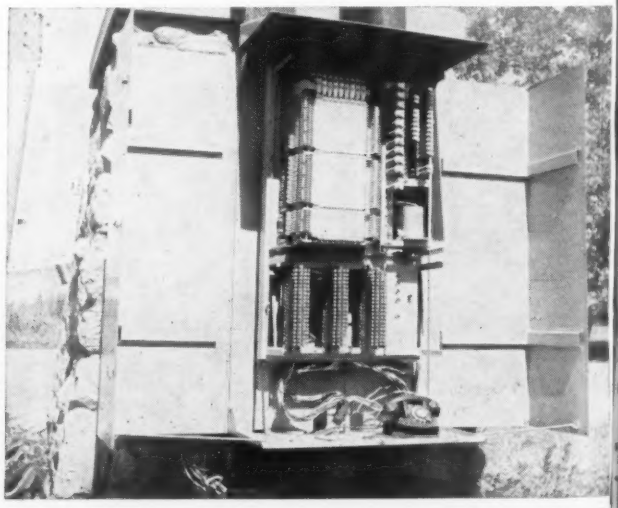

FIG. THREE: — A view of the actual equipment. In addition to the cabinet doors which have been opened, another cover is provided for the unit itself. Trunk selector switches are at the top left, associated relays are at the top right, and the protectors for the "in" and "out" distribution wiring can be seen at the bottom of the cabinet. 19 lines serving 132 stations have been assigned.

had several interesting articles in past issues of *Telephone Engineer and Management* concerning possible methods of solution, and *Harry Garman's* article in the June 1 issue of TE&M further emphasized the fact that the eight-party line may not be "long for this world." Mr. Garman's article concerned the method which the Indiana Bell Telephone Co. is using to furnish one, two and four-party line service to any rural or suburban residence within the exchange area. Basically, the plan consisted of offering a standard rate in zoned areas, roughly circling the exchange, and then supplying the service by the simple, brute-force expedient of building the cable and open-wire plant necessary to handle the demand.

More and More Outside Plant

IT ALL BOILS down to the fact that all of us need more outside plant — more lines extending out to the periphery of our exchange areas — and that we must get them there in some manner, whether it be by brute-force cable and open wire additions, subscriber carrier, multiplexing, or by line concentrators.

The last mentioned method, line concentrators, offers an extremely interesting method of providing the equivalent of more lines to distant subscribers. Used with proper engineering discrimination, it may be the right answer for relieving subscriber pressure in areas where insufficient plant now exists and cannot be provided economically.

Perhaps a review, at this time, of the basic fundamentals of line concentrators might be in order. Our subscribers actually use our equipment less than five percent of the available time. During the other ninety-five percent of the day, the equipment and facilities are idle and serving no useful purpose. In our central office, it would be folly to provide one linefinder for every subscriber line which we serve. By means of proper traffic engineering, we actually provide only a fraction of such linefinders, for the total number of lines served, and still are able to give our subscribers telephone service on 999 out of 1,000 attempts. (1 in 1000 G. S.) Practically the same theory underlies a line concentrator. Why provide a physical pair of wires for every subscriber line, from our central office to the distant end, when it will only actually be used five percent of the time? Why not, instead, only provide the number of physical pairs necessary to serve a larger number of lines which, in turn, can be served from a distribution point located in such a manner as to require the minimum line mileage?

The Equipment Is Available

EQUIPMENT utilizing this principle was originally developed in Europe and has been extensively used. For the past several years, imported line concentrators and units manufactured in this country have become available and are being widely accepted.

Each installation consists of two units — one located in the exchange and one at the distant distribution point. Installation of the exchange unit consists mainly in changes in mainframe jumpering. (*See Figure One.*) Subscriber line jumpers connect to the concentrator unit rather than directly to the cable pairs. The concentrator is then, in turn, jumpered to the appropriate cable pairs. The unit installed at the distant distribution point is usually pole-mounted, in a weather-proof cabinet, and requires no outside source of power as this is fed from the central office.

The concentrator units are supplied in a variety of sizes extending from units which will handle twenty subscriber lines and require a total of eleven interconnecting cable pairs to units which will handle forty-nine subscriber lines and require a total of twenty-one interconnecting cable pairs. Other sizes are available in between these two extremes. Price of the units varies from approximately $2,750.00 for the smallest size unit to $5,800.00 for the largest and most completely equipped units. In addition to a choice of size, the purchaser also has a choice of several options concerning ATB metering, ringback tone, or busy tone to subscriber in event of ATB condition, etc.

FIG. FOUR: — JAMES KOONTZ, manager of the Bremen (Ind.) Telephone Co., makes a test call over the unit. At the present time, a total of 132 stations is being served by the concentrator unit and a large amount of expansion can also be handled.

An Actual Installation

PERHAPS a description of an actual situation and installation will serve to more adequately describe the possibilities and economics of the use of line concentrators.

The city of Bremen, Ind., is located in the north central part of the state and telephone service is provided by a modern step-by-step dial office. A comparatively small but very attractive lake is located within the Bremen exchange area and approximately five miles southwest of the central office. For many years, only a smattering of small cottages bordered the lake with most of them being in the "summer home" category.

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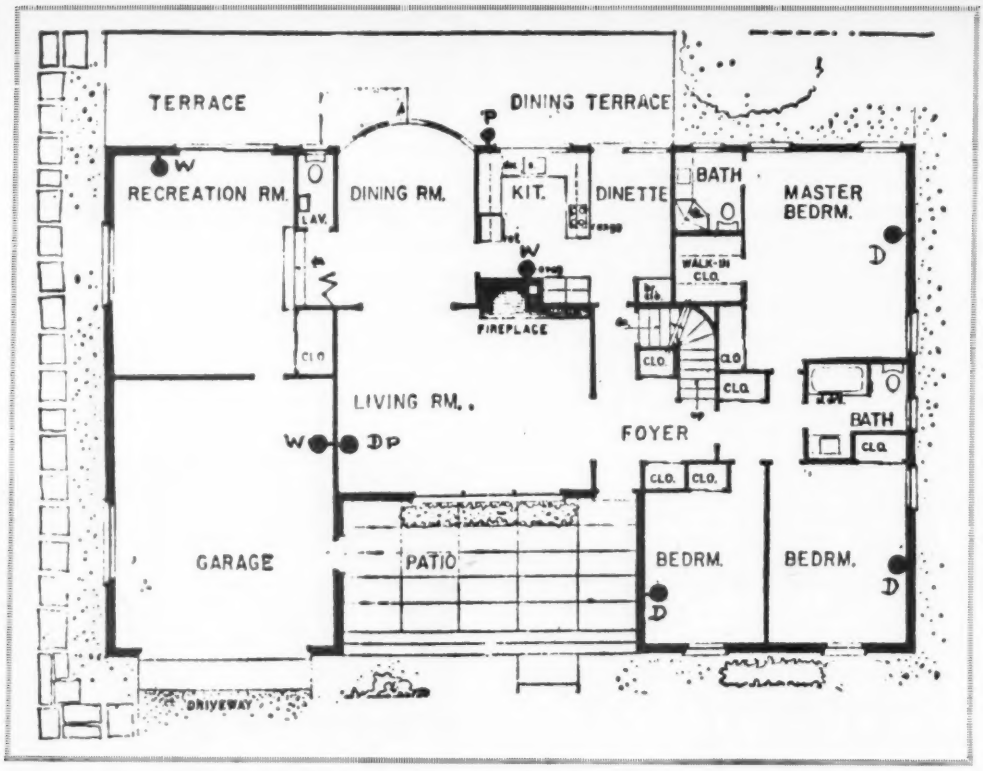

FIG. ONE: — Typical dwelling floor plan showing telephone outlets (filled circles). "D" indicates desk handset, "W" is wall handset, "DP" is portable desk handset, and "P" outside jack for portable desk handset. Outlets for wall handsets are located at 56-inch height. Other outlets are placed on level with electric convenience outlets in same room, usually about 12 inches above the floor.

THE PLANT MAN'S ROLE IN THE PRE-WIRING PROGRAM

By DICK REYNOLDS

The installation of telephone wiring for more than one outlet is a costly procedure if the wiring is installed after the house is built.

FOR THE average family, perhaps the most important purchase it can make is a home. The husband looks for sound construction, good plumbing, and a roomy garage in the house of his choice. The wife seeks a convenient arrangement of the rooms, plenty of storage space, an efficient kitchen, and built-in appliances.

The modern house builders have become aware of the family's wants and today's contractors are striving to meet the desire for a more casual, convenient mode of living. New homes are being designed for space and convenience. There are built-in ironing boards, ovens, refrigerators, dishwashers, and desks to catch the average family's fancy. The built-in idea has extended beyond the kitchen and now includes built-in telephone service throughout the house.

Telephone plant men recognize the built-in telephone service idea as "prewiring" or "advance wiring" as it is called in different parts of the country. Recent articles in *Telephone Engineer and Management* have stressed the importance of providing this type of service prior to the complete finishing of a new family dwelling.*

Present-day house construction makes the placing of telephone wiring for more than one outlet a difficult and expensive process if the wiring is installed after the house is built. This is especially true when the dwelling

*"*Prewiring of Customer Premises,*" *Allan R. Stacey* (*TE&M, August* 15, 1959); "*Prewiring Boosts Phones per Home,*" *Allan Stacey* (*TE&M, November* 15, 1959).

has a slab foundation and no attic, and the customer requires concealment of the wiring. With only one outlet available, the sale of additional telephone service is retarded.

Prewiring of the dwelling before its completion, while the walls are open, enables the placing of multiple outlets, which very definitely encourage the sale of extensions and additional lines. The wiring may be brought to a central point and terminated on a multiple terminal block so connections may be made for extension telephones or separate main lines as desired. In some cases conduit may be placed, usually by the contractor, so that station wires may be pulled in on completion of the dwelling. It is an excellent idea to place entrance conduit for the drop wire to avoid running the wire on the outside of the building. Some customers may desire an underground entrance which can be provided by placing underground conduit or by installing buried wire from the pole to the house.

Commercial department activities in the promotion of advance wiring in the larger exchanges, where there are a large number of new dwellings, may be handled by home planning service groups. The service groups make contacts with builders and contractors to coordinate details and also provide owners of new prewired homes with information on telephone equipment and color styles of telephones to match room decor. These people also will recommend the best locations for telephone outlets and instruct electrical contractors on routes for station wires.

Although the commercial department people in many companies are actively engaged in promoting the prewiring of new dwellings, the plant man also has an important part to play in this project. Installers, combinationmen, and service foremen travel over the town area on their daily assignments. These men are in a position to note where new dwellings are being started, possibly long before others in the telephone company may learn of this fact through other sources. By reporting the new construction projects, these plant employes enable contacts to be made with the builders and contractors in plenty of time to discuss plans for prewiring the houses.

Concealing Station Wires

THE USE of concealed wiring is generally recommended for single-family residences and duplexes. Apartment houses preferably should have conduit installed for minimum maintenance and ease of installation of telephone service.

The method of concealing station wires described here differs from the usual practice of having the telephone company installer thread the wire inside walls and partitions by boring holes in certain locations and then pulling the wire through with a fishing device. In this case, the house builder installs standard 3″ x 2″ x 2¼″ conduit boxes equipped with clamps designed to accommodate non-metallic sheathed cable. He places a pull wire in each box extending to a common terminating point, for pulling in station wires which preferably should be of the jacketed type. (In some situations, in-

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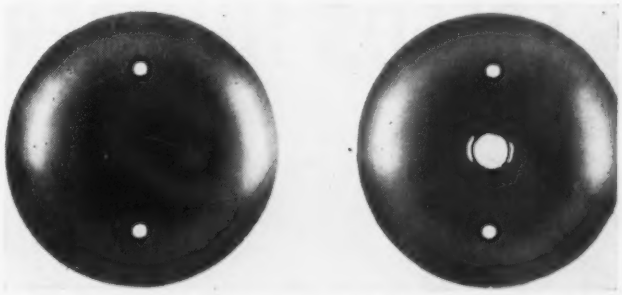


FIG. TWO: — Cover or face plates for telephone outlets. The one at the right has a hole in the center for the telephone instrument cord. Rectangular cover plates may be used if preferred. (Suttle Equipment Corp.)

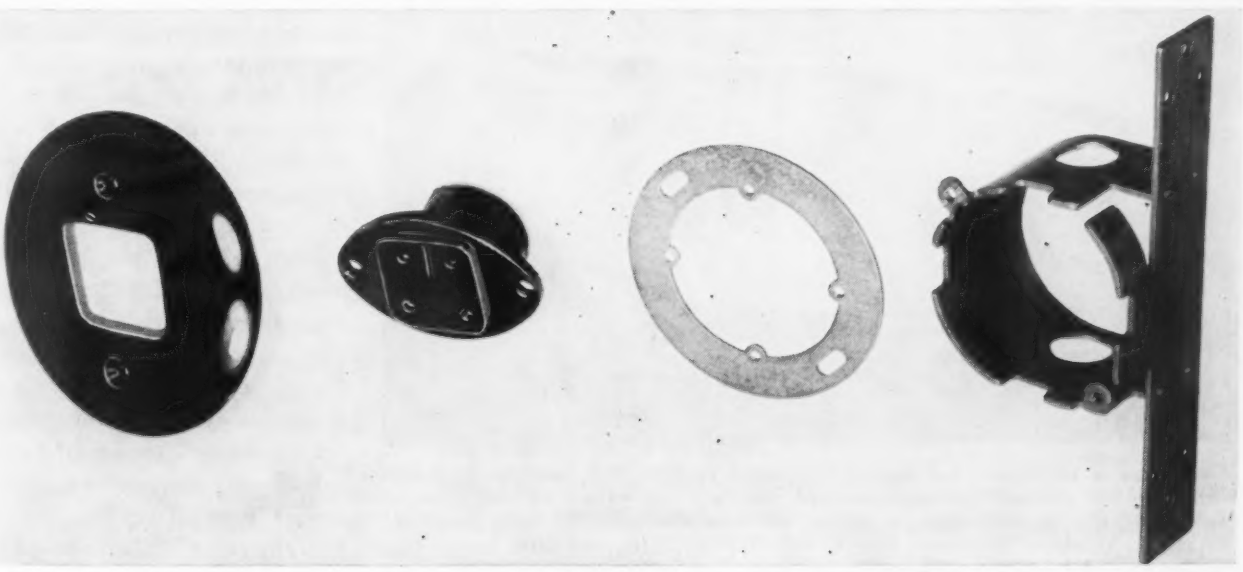


FIG. THREE: — Plug and jack assembly for portable telephone using round face plate, oval flush type jack, mounting ring and open type junction box designed to be fastened to a wall stud.

PLANT ENGINEERING NOTES

By JOHN S. REED
Technical Editor, TELEPHONE ENGINEER & MANAGEMENT

DIRECT MAIL SYSTEM SPEEDS NUMBER CHANGE PROGRAM

Gen. Tel. of Pennsylvania uses stick-on dial cards to reduce telephone number change workload.

IN ADDITION to the tremendous physical task involved in making a large scale change of telephone numbers, the job of notifying subscribers and changing the dial discs on all the instruments also becomes monumental.

Recently the General Telephone Co. of Pennsylvania minimized the chore by doing it entirely by mail. About 4,800 York Telephone & Telegraph Co. numbers and 3,700 in the Erie division of General Telephone were changed.

Examining a telephone dial disc card printed by the IBM machine is DALE CORNELIUS, commercial methods and practices supervisor of the General Telephone Co. of Pennsylvania. At the right of the machine are: JOHN E. TAYLOR, machine operator; RAYMOND WIESZCZYK, machine accounting supervisor; and JAMES OSBORNE, revenue accounting supervisor. The scene is in the headquarter offices of the company at Erie. The preprinted, die-cut adhesive backed cards were supplied by the Topflight Corp., of York.

Using IBM automatic equipment notification cards were imprinted with each subscriber's name and address, the old and the new numbers. These were mailed in window envelopes.

Then, also using the IBM machines, another set of pre-printed and die-cut cards were addressed and the new numbers imprinted on the dial discs which were part of the card. These also were mailed in window envelopes. The numbered dial disc cards were a do-it-yourself device supplied by the Topflight Corp.

They were an adaptation of this firm's patented Mail-O-Stix, which is a pressure-sensitive card with a backing paper covering the adhesive. These are printed with instructions and the discs are die-cut through to but not through, the backing paper.

Following instructions, the subscriber picks off the disc and applies it to the center of the telephone dial. Pressing firmly with a finger makes it stick and stay in place.

HERE IS A *NEW* NUMBER CARD FOR YOUR TELEPHONE

IN MAY, WE NOTIFIED YOU THAT IT WOULD BE NECESSARY TO CHANGE YOUR TELEPHONE NUMBER ON JUNE 22, 1960. THE ATTACHED NUMBER CARDS SHOW YOUR NEW NUMBER AS LISTED IN THE NEW DIRECTORY WHICH WILL BE DELIVERED ON JUNE 22, THE DAY YOUR NEW NUMBER BECOMES EFFECTIVE. IF YOU NEED ADDITIONAL NUMBER CARDS, PLEASE CALL OUR BUSINESS OFFICE.

HOW TO PLACE THE NUMBER CARD

1. Make sure that the surface of the celluloid cover over the present number card on your telephone is clean and dry.
2. Bend at arrow and peel off new number card.
3. Hold the new card over the celluloid cover so that the new card is in the same position as the old one.
4. Press the new card firmly in place, particularly around the edges.

PLEASE CONTINUE TO USE YOUR PRESENT DIRECTORY AND TELEPHONE NUMBER UNTIL JUNE 22. THANK YOU FOR YOUR COOPERATION.

YORK TELEPHONE AND TELEGRAPH COMPANY

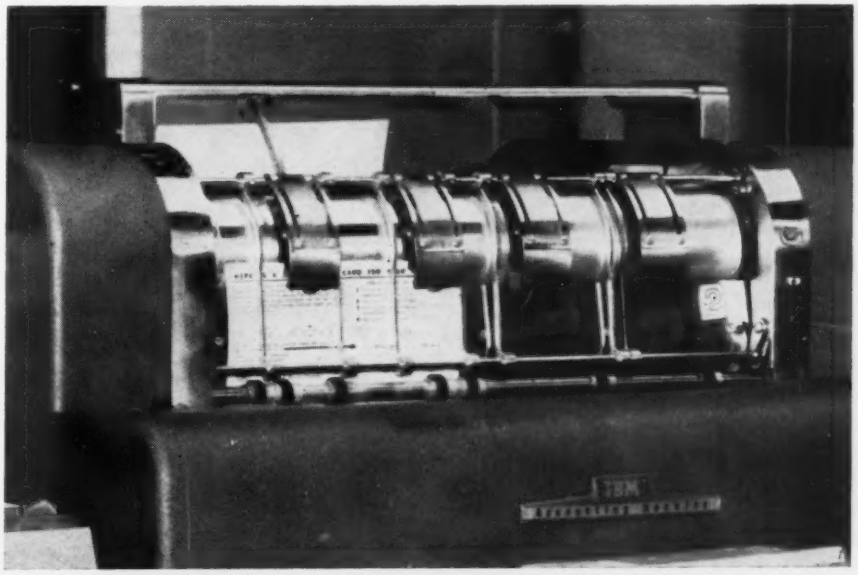
YORK
WAIT FOR DIAL TONE

YORK
WAIT FOR DIAL TONE

Notification cards carried subscriber's name and address, and the old and new telephone numbers.

The prepared data was ready to feed into the machines as soon as the printed and die cut cards were received from the Topflight plant at the main General Telephone office in Erie. Using a type 403 IBM machine, 8,534 of the stick-on dial cards were processed in less than eight hours. On each card was printed the customer's name and address, the old telephone number, and the new number on two Pick-Off dial discs. To process this many cards with the same data by typewriter would have taken approximately 529 hours, according to General Telephone officials.

Telephone customers cooperated very well and there was little confusion and misunderstanding.



Close up of IBM machine printing name and telephone disc numbers on Topflight Mail-O-Stix card.

Fiberglass Floor Halts Equipment Vibration

THE INSTALLATION of telephone switching equipment for PBX service in a building housing heavy plant machinery involves vibration problems. The vibration from the machinery may be such as to affect the telephone equipment operation.

An example of this kind of problem occurred when a threefold increase in the size of telephone facilities was necessitated by plant expansion. Pall Corp., Glen Cove, N.Y., needed a vibration-free room. The only available space was a room, 18 ft. by 20 ft., located directly above 2-high, 24-in. wide steel rolling mill and a 10-foot, ¼-in. Cincinnati shear. To solve this problem, it was decided to use a technique of vibration damping employed successfully by one of the Pall Corp. subsidiaries, Fibrous Glass Products, Inc., of Hicksville, N. Y.

The original floor consisted of a single layer of quarter-inch plywood laid over a basic subflooring, which in turn was directly over the beams. Some of the plywood veneer had begun to warp, but this was not considered serious. Nor was the accumulated dirt significant, except that the loose pieces had to be swept out.

The plans called for completion of half of the room at one time, moving of existing telephone switching equipment (701 PBX step-by-step dial type) to the newly laid portion, then completion of the second half of the room. Afterwards, additional telephone equipment was to be brought in.

Initial preparation consisted of sweeping the floor. Using ordinary asphalt tile cement, two men started from one corner to lay a thin coating over the existing floor. (*Figure One*). As they finished a large enough portion, they laid several sections of resin-bonded fiberglass board measuring 3 ft. by 5 ft. and 1-in. thick.

The first half of the floor was covered first with the fiberglass panels. Once completed, the two men moved back to their starting point and covered the fiberglass panels with the cement. As soon as they had spread

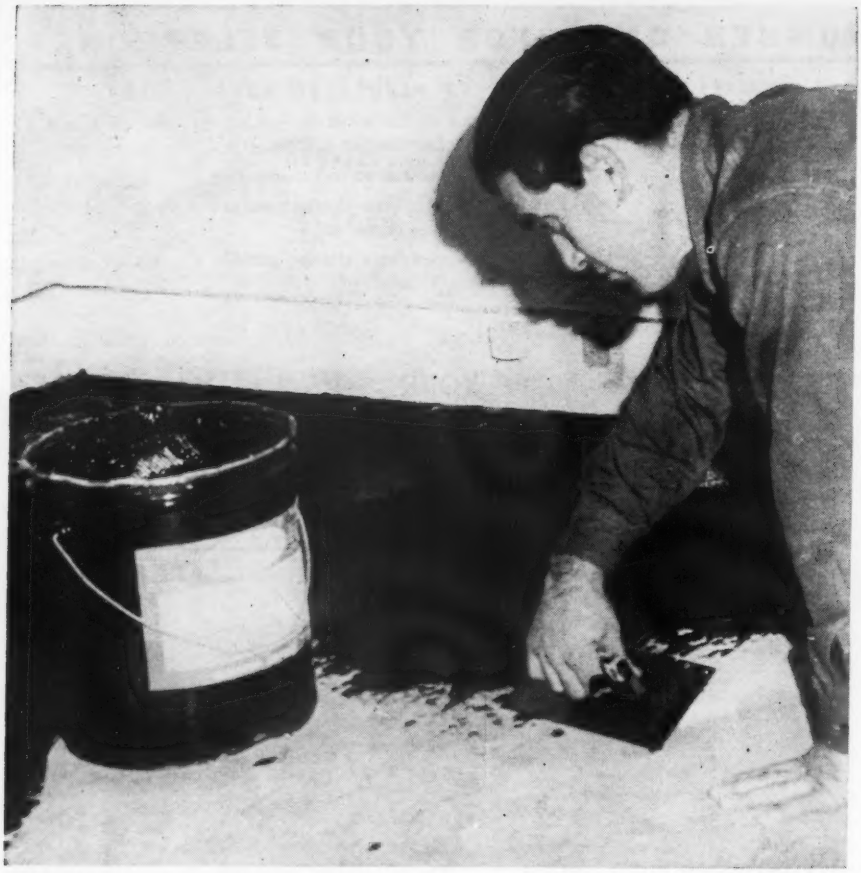


FIG. ONE: — Spreading asphalt tile cement over basic floor prior to laying fiberglass panels.

FIG. TWO: — Nine ft. wide linoleum is cemented on top of the plywood panels to provide a continuous smooth covering.

a section large enough for a 4 by 8 plywood section, they laid the plywood, 3/4-inch thick, on the covered area. Both the fiberglass panels and the plywood were placed at a distance of one inch from the nearest vertical walls to minimize transmission of vibration through the walls.

After laying the plywood for the first half of the room, linoleum was laid on the plywood (*Figure* 2). The linoleum came in a 9-foot roll and was cut to fit. It too was placed an inch from each vertical wall.

Upon completion of the first half of the room, the existing telephone equipment was moved to the finished portion. Then the rest of the room was finished in the same way as the first half. As the workmen reached the ends of the room, they had to cut some panels to fit. The fiberglass was easily cut with a sharp knife; the plywood was measured and cut on a convenient radial saw.

Soldering Methods

SOLDERING of components in crowded spaces presents the hazard of damage to other components in the immediate vicinity, particularly diodes and transistors on wiring boards. Even a "pencil" type iron or quick-heating type soldering gun may be unsafe for such use.

It is possible to convert a quick heating (Weller) soldering gun to a resistance heating device by cutting off the rounded tip of the heavy gauge copper wire used for the heating element. The two ends of the wire element are pressed against the joint to be soldered and the trigger pressed to produce heat in the joint itself.

Since the heat is concentrated in the joint through its resistance, the temperature quickly builds up to the desired degree for soldering. At the same time the gun element will not heat up to this extent, so the adjacent components are not affected.

You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

(A) Tilt the head back so the chin is pointing upward. If there is any foreign matter visible in the mouth, wipe it out with fingers or a cloth wrapped around the fingers.

(B) Pull or push the jaw into a jutting-out position. These maneuvers should relieve obstruction of the airway by moving the base of the tongue away from in back of the throat.

(C) Readying the victim for application of the "mouth-to-mouth" method of artificial respiration.

(D) Open your mouth wide and place it tightly over the victim's mouth. At the same time pinch the victim's nostrils shut. This forces air down the throat of the victim.

(E) You can also close the nostrils with your cheek as shown here. You can blow into either the mouth or nose and even through the victim's teeth if they are clenched tight.

FIG. ONE: — Mouth-to-mouth resuscitation procedure. (American Red Cross)

RESCUE BREATHING TECHNIQUE GAINS PLANT APPROVAL

By MYRLE SHAFER

NOT long ago a fantastic incident occurred in which a resuscitation attempt failed simply because the method was so novel that the user, a trained first aider, was prevented from applying the procedure by the crowd which had collected at the rescue scene. Bystanders pulled the young man away from the victim and tried to apply their ideas of the standard resuscitation method. The resulting confusion and loss of valuable time before professional aid came was said to be the cause of the victim's death.

The resuscitation procedure that had seemed so wrong to these well-meaning persons was the new mouth-to-mouth method sanctioned by the American Red Cross for use on both adults and children. A committee of the National Academy of Sciences, National Research Council, has unanimously endorsed the new technique as being the most practical of all methods of artificial respiration investigated.

Mouth-to-Mouth Breathing Technique

THE STANDARD mouth-to-mouth technique, as outlined in a supplement to the Red Cross First Aid Textbook and illustrated in *Figure One*, is as follows:

As soon as the unconscious person is discovered, proceed with the artificial respiration immediately.

(A) Lay the victim on his back. If necessary, turn the head and remove foreign matter from his mouth and throat. Tilt his head back from behind and insert the airway past his tongue to the point where the flange cups over his lips. Hold the tongue forward during this operation, if necessary, to prevent it from being forced into the throat.

(B) Close the victim's nostrils with the thumbs, press down on the flange and hold his chin up with the fingers as shown. Blow through the airway with a deep breath until the victim's chest is seen to rise. Then take the mouth away and allow the air to escape from his lungs. When the exhalation stops, repeat blowing through the airway. The first few breaths are made deep and rapid, after which the rate may be maintained at 3 to 4 seconds for each breath.

FIG. TWO: — Another rescue breathing technique using plastic airway. (Johnson and Johnson)

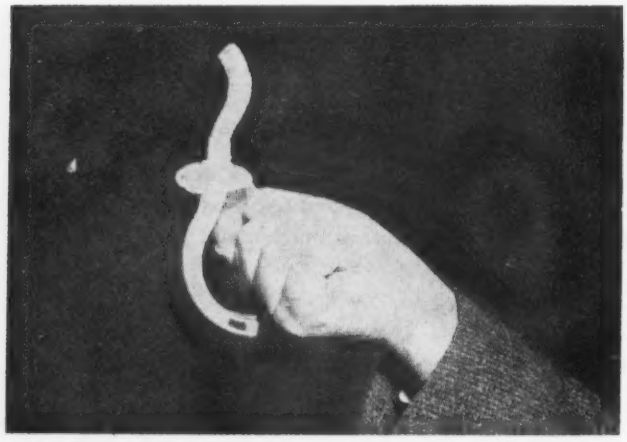


FIG. THREE: — Showing appearance of Johnson and Johnson "Resusitube" employed in mouth-to-airway resuscitation. Upper portion of tube is used for children over 3 years old, lower portion is for adults. For children under 3 years and infants, mouth-to-mouth resuscitation is employed.

If there is foreign matter visible in the mouth, wipe it out quickly with the fingers or with a cloth wrapped around the fingers. Then —

(1) Tilt the head back so the chin is pointed upward. Pull or push the jaw into a jutting-out position. This action should relieve obstruction of the airway by moving the base of the tongue away from the back of the throat.

(2) Open your mouth wide and place it tightly over the victim's mouth. At the same time pinch the victim's nostrils shut or close the nostrils with your cheek, or close the victim's mouth and place your mouth over the nose. Blow into the victim's mouth or nose. Air may be blown through the victim's teeth, even though they may be clenched. (The first blowing efforts should determine whether or not obstruction exists.)

(3) Remove your mouth, turn your head to the side, and listen for the return rush of air that indicates air exchange. Repeat the blowing effort.

About three years ago the Red Cross adopted the mouth-to-mouth resuscitation technique for infants and small children. The method is the same for adults with important differences as follows:

(1) When applying mouth-to-mouth resuscitation to a child, relatively shallow breaths are taken in proportion to the child's size at the rate of about 20 a minute. In the case of an adult, the rescuer blows vigorously at the rate of about 12 times a minute.

(2) If failure to get air exchange occurs at first, the head and jaw position should be checked to make sure the tongue is not obstructing the airway. When a child is involved, it should be upended by grasping the ankles and two or three sharp slaps applied between the shoulder blades. An adult should be turned on the side to enable blows to be applied on the back to dislodge obstructing matter, if possible.

Many rescuers would not like to come in direct contact with the victim in the manner just described. In this case, a handkerchief or other clean cloth may be placed on the victim's mouth and breathed through. There will be very little interference with the air flow and the rescuer avoids the oral contact.

Mouth-to-Airway Resuscitation Method

A VARIATION of the rescue breathing procedure employs a plastic tube or airway which is likely to be more acceptable to the rescuer than the direct oral contact involved in mouth-to-mouth resuscitation. The airway is inserted in the patient's mouth to provide an unobstructed breathing passageway for the victim. The mouth-to-airway method is explained in *Figures Two and Three*. The direct mouth-to-mouth procedure will be needed if an airway is not immediately available or cannot be used because of a tightly closed jaw or for other reasons. The airway is intended for use on adults and children over three years old.

The plastic airway is available with a dust protector

Please turn to page 62

INTRODUCING

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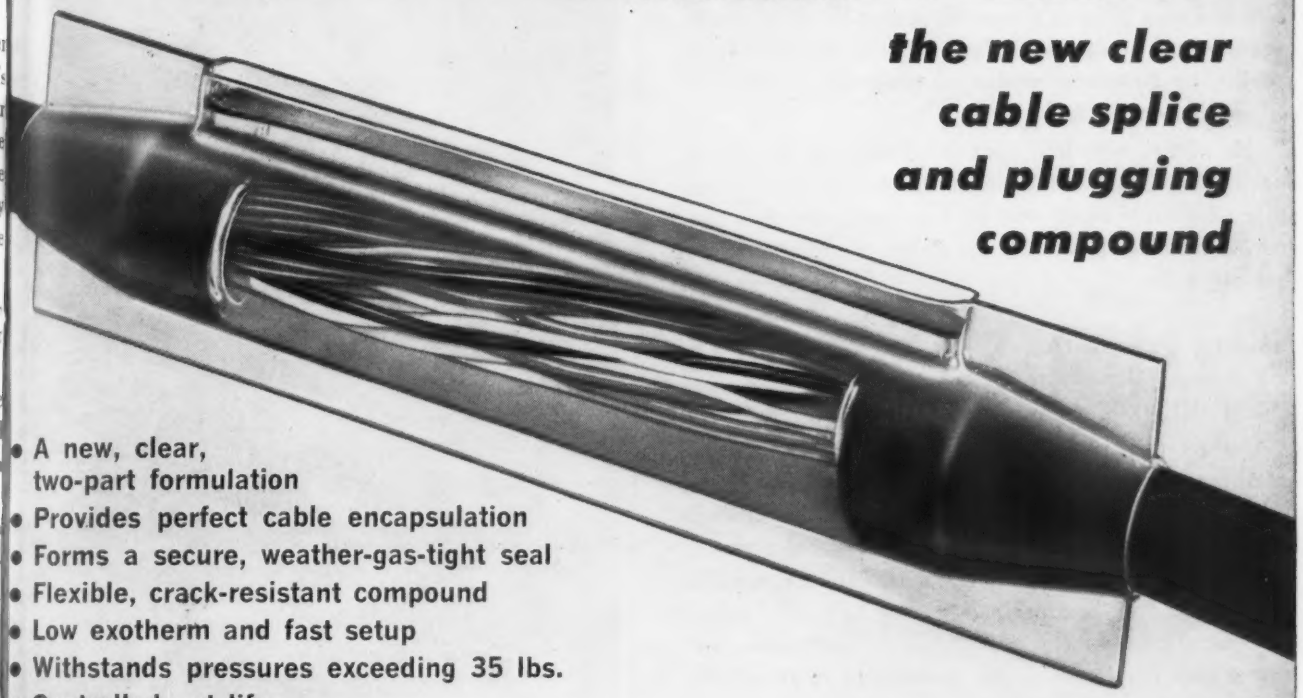

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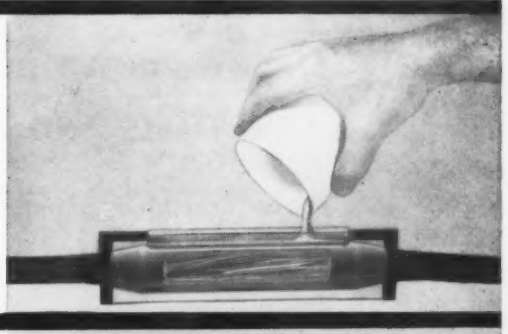
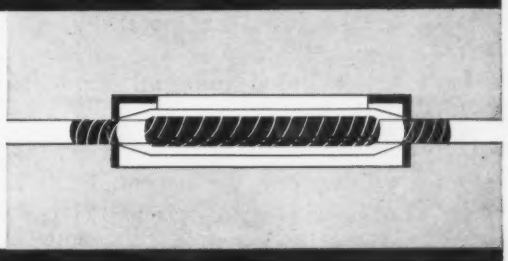
Semper-Seal, a new epoxy-type resin incorporating the advantages of proven durability, weather-tight sealing and transparent clarity for perfect cable encapsulation. The simple to use and transparent qualities of Semper-Seal enables field splices and blocks to be accomplished and inspected in a minimum of time with the visible assurity of knowing a solid seal has been made. Semper-Seal is a two-part compound consisting of a resin and hardener which when mixed together create a thermosetting action. The compound, through its own chemical change will, in 30-45 minutes, become a solid, clear, air-tight seal.

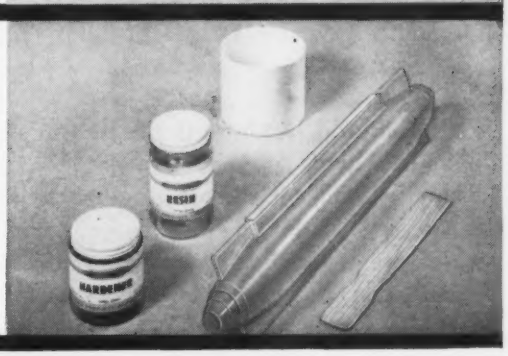
Write today for complete information on NEW Semper-Seal.



Semper-Seal being poured into the plastic Vu-Mold which has been tape-sealed over the cable opening.



Semper-Seal provides an ideal means of forming trouble splices on pressurized cables.



Semper-Seal is available in convenient kits or in bulk form.

C & S PRODUCTS COMPANY
Windsor Locks, Connecticut

"RESCUE BREATHING"

(Continued from page 60)

and may be kept in a suitable container in company trucks and central office buildings for emergency use.

The present manual resuscitation procedures described in the Red Cross First Aid Textbook are still valid and may be used where the rescue breathing technique cannot be applied. These are the chest-pressure, arm-lift or Sylvester, and back-pressure, arm-lift or Holger-Nielson methods.

It is well to note here that the American Red Cross does not endorse nor condemn the use of airways or other adjunctive equipment of any kind, and does not provide instructions on the use of this equipment in its first aid courses.

Training Procedure For Rescue Breathing

SOME KIND of training aid is needed to properly instruct plant employes in the technique of rescue breathing, particularly if an airway is employed.

A practice "lung" unit is available as illustrated in *Figures Four* and *Five*. This device consists of a plastic bag or "lung" with tube, mouth mask, and expendable mouthpiece. The "victim" has the bag tied in place on his chest and lies on his back in the demonstration. The trainee then breathes into the mouthpiece in simulation of the actual mouth-to-airway resuscitation procedure. The instructor explains the proper technique and the trainee practices the method until he is certain of the proper procedure. — *Myrle Shafer.*

FIG. FOUR: — Telephone plant man using training aid (Breathe Life Trainer) during a demonstration and explanation of the mouth-to-mouth or airway type of artificial respiration. Instead of breathing into the victim's lungs, he is blowing into the chest bag, a type of practice which is considered to be sanitary and very realistic.

FIG. FIVE: — Closeup of the practice device used in training plant men shows the gauze and cardboard disposable mouthpiece about to be attached to the tube, the hose which leads to the inflatable bag, the mouth fitting grasped by the "victim" and the hole in the tube through which he breathes.

QUESTIONS AND ANSWERS ON RESCUE BREATHING

How does rescue breathing compare with the arm-lift manual method?

It is simple, and any obstruction of the air passage can be readily detected.

Isn't my exhaled air bad air filled with carbon dioxide?

If you inhale about twice as deeply as normal before breathing into the patient, he will receive plenty of oxygen. (Inspired air has 21 percent oxygen, and expired air has 19 percent oxygen. Expired air contains 3 percent carbon dioxide.)

What should be done if the victim's tongue blocks his throat?

The chest will not rise when you breathe in. In this case, try clearing the air passage by pulling the jaw outward or by pressing forward on the jawbone. Then tilt the head back and resume the breathing operation.

What about germs if I put my mouth on a stranger's?

Do not be concerned about germs when a life is at stake. If you're squeamish about this oral contact, hold a handkerchief over the victim's mouth and nose and breathe through it. The cloth will not interfere too much with the exchange of air.

For how long should one blow breath into the victim?

Only until the chest rises. If you get dizzy or lightheaded from breathing into the victim, slow down your breathing rate. The breathing rate is about 12 per minute for adults and 20 per minute for children and infants. Breathing should be more shallow and gentle for a very young victim.

What about the possibility of blowing air into the stomach?

A gentle push on the patient's stomach will remove any air that gets into it.

What should be done if the victim's teeth are clenched so you cannot breathe directly into the mouth?

Cover the mouth with your hand and breath through the nostrils.

When should rescue breathing be started on a drowning victim?

As soon as possible, even before the patient is ashore.

What may happen in the case of a drowning victim?

Your first breath into him may bring water out. Push gently on his stomach to let the water flow out of his mouth. Then clear his throat and resume rescue breathing.

How can you tell if a person needs resuscitation?

You may detect oxygen shortage by the blue coloring of the victim's lips, tongue, and finger nails.

Why should the nostrils be pinched when an adult is being resuscitated?

This prevents air leakage.

How can one tell if the rescue breathing is working?

The victim's skin color will gradually change to a glowing pink.

What other accidents beside drowning may cause asphyxiation?

Carbon monoxide poisoning, electric shock, a foreign body lodged in the throat, an overdose of some kinds of medicines, or an injury to the chest.

What should be done as the first step in rescuing a victim of carbon monoxide poisoning?

Bring the patient into fresh air and begin rescue breathing immediately. Obtain medical aid at once.

What precautions should be taken in saving an electric shock victim?

Make sure he is not still in contact with the electric current. Then begin rescue breathing right away and send for medical aid.

May anyone use the rescue breathing technique?

Yes, even a youngster may save the life of an adult or a playmate through his knowledge of the mouth-to-mouth breathing method.

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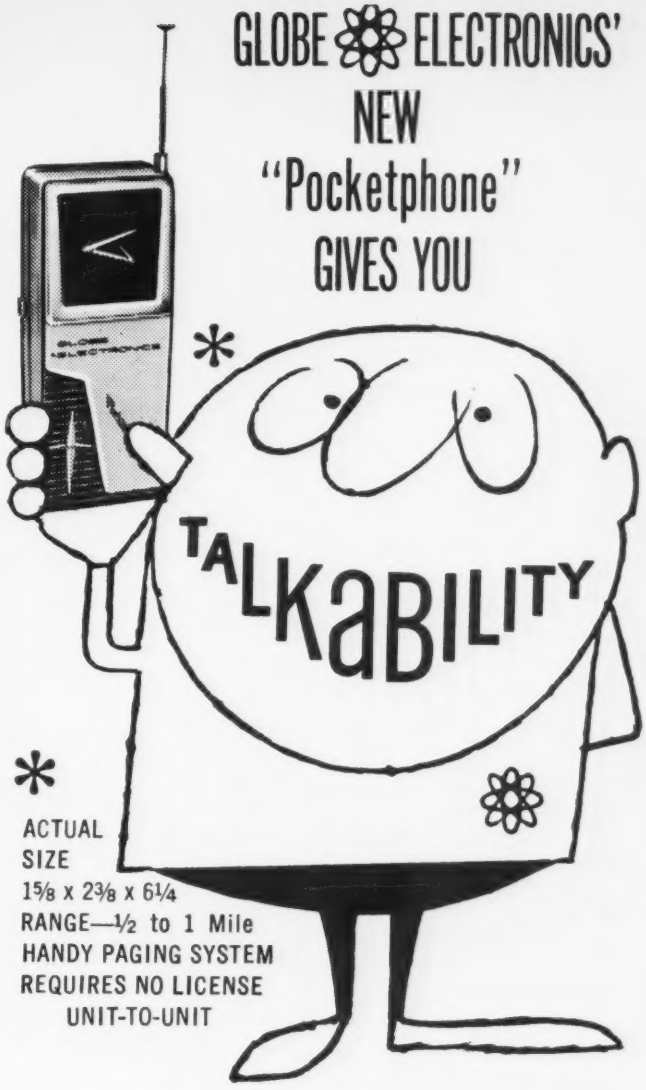

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New portable high styled two-way radio that actually fits into your pocket. Exclusive "power-pak" rechargeable battery lasts a year or more. For factory, surveying, construction, department stores, stock-yards, hospitals, firemen, policemen, golf, office, and home. Price: $125.00 each.

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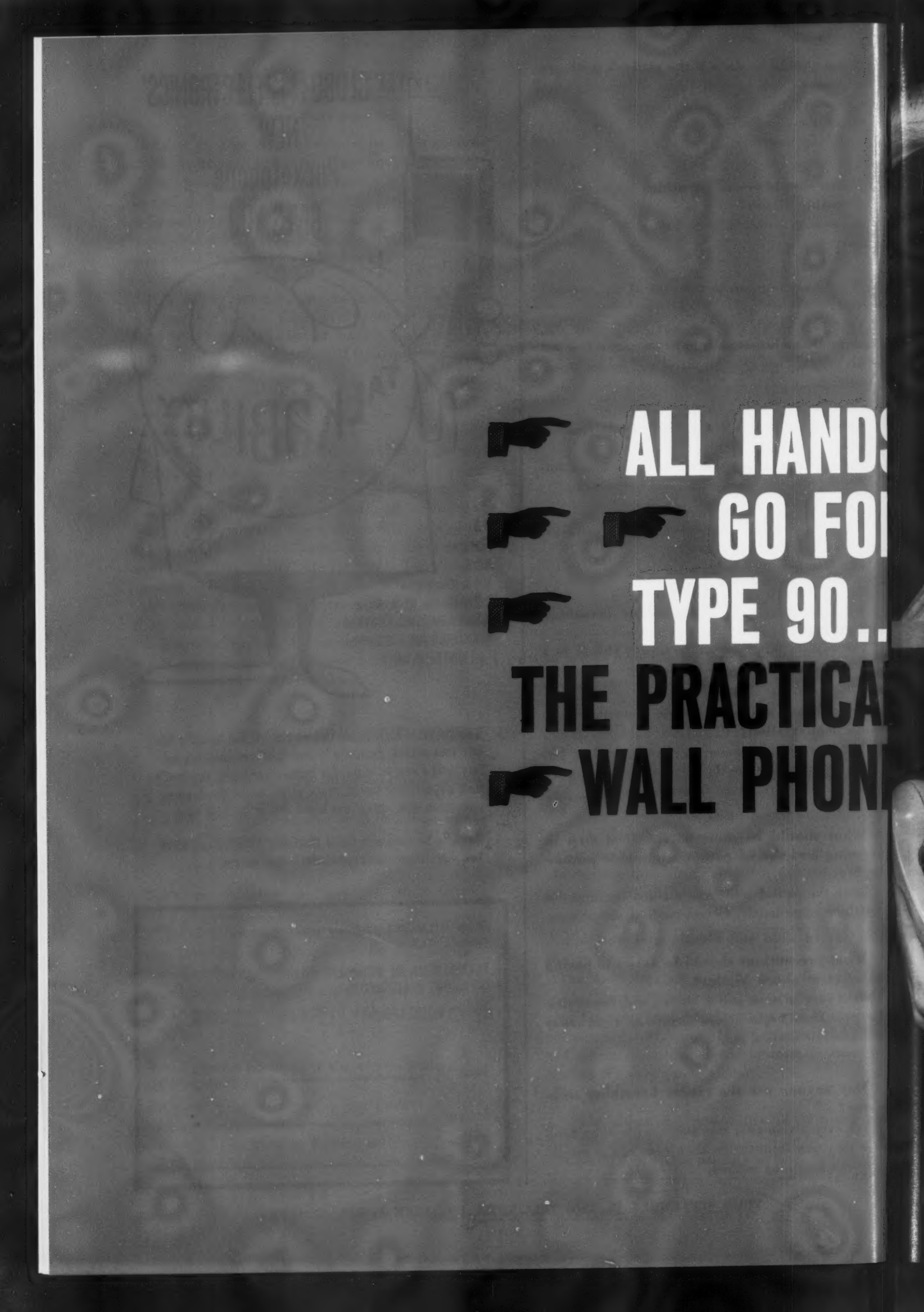
ALL HAND
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TYPE 90..
THE PRACTICA
WALL PHON

For Hands That Install and Maintain...A Real Snap

Loosen one screw, the cover lifts off and you fasten Type 90 to the wall (handset stays in the cradle). The loop compensator is adjusted from the front. To remove the dial, just push and lift. And, you can remove the ringer from the front—without taking the phone off the wall.

Type 90's ***slam-proof cradle bracket*** means fewer maintenance calls, too. The chrome-plated cradle is securely fitted to a sturdy shaft that turns in a long bearing-bracket...won't break even under the toughest slamming!

The ***wrap-around cradle*** holds the handset snugly, keeps "off-hook" troubles to a minimum. The handset can't be dragged, brushed or knocked off the hook.

For Hands That Spin The Dial...A Real Pleasure

Your subscribers like Type 90's smart, functional design. Its shallow profile and ***side-mounted handset*** keep it from sticking into the room. The ***special-angle dial*** makes the numbers easier to read. People like to choose from 10 decorator colors, too. They're sure to find one to fit their color scheme.

All these features make Type 90 a pleasure to use. And pleased subscribers do wonders for revenue. Why not let yours do wonders for you? To order, just write Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16, Ontario.

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GENERAL SYSTEM

INDUSTRY OBSERVATIONS

By L. A. GRITTEN

Problem For Sibyl

SIBYL is not a lady. She is a complex device used by Bell Laboratory scientists when they wish to try something different on the public. The lines of selected test users are intercepted, and Sibyl gives them simulated services in their normal use of the telephone.

Recently the apparatus has been modified (Bell Laboratories *Record*, August, 1960) to test the users' reactions to the time lag in speech bounced off spatial satellites. Even at 186,000 miles a second, the lag is a deterring factor. On "moon bounce" messages it amounts to nearly 2½ seconds. With a satellite 22,300 miles up (the height necessary for a satellite to "move with the earth" and appear stationary over one place) the lag is only about six-tenths of a second; but that may be enough to irritate the talkers and cause interruptions and confusion.

With the cooperation of the test users, Sibyl will find out how much delay can be tolerated and, perhaps, what to do about it.

Sibyl has not yet determined how the spatial time lag will affect a conversation between two women talking simultaneously.

From Goose Quill To C.P.S.

THE evolution of the American secretary is wonderful to consider. Once upon a time, it was a man, equipped with a moustache, sidewhiskers, quill pen, snuff box and a briar pipe in his tail pocket. Then Peregrine Williamson invented the steel pen. Pitman introduced a new system of shorthand. Typewriters emerged from the status of Patent Office curios. Occasionally a daring woman broke into the business world, looking oddly out of place with leg-of-mutton sleeves, skirts that swept the office floor and a Gibson coiffure.

Suddenly the male secretaries found themselves obsolescent. Their clumsy middle fingers could not compete with touch typing techniques at 90 words a minute. Women could be hired for wages that no man, with a family to support and a taste for good whiskey, could tolerate — and they were more fun to have around.

The first World War completed the transition. Men were wanted elsewhere. When they returned, the girls had stepped in. There was a postwar phase wherein a secretary was defined, truthfully and without malice, as "that which learns to spell and write at the expense of her boss, while preparing to acquire a husband and become a housewife." There are still many of that kind, but there has been steady progress towards the modern secretary, the poised, efficient, immaculately dressed tyrant who sits with legs alluringly crossed and pretends to take down our "and, er, ers" and our stale cliches, and then goes out and types the letter that we should have dictated — but didn't.

The final stage in the development, the ultimate triumph of the evolution, is known as the Certified Professional Secretary, a product of the National Secretaries Association of 1103 Grand Avenue, Kansas City, Mo. This organization has an "Institute for Certifying Secretaries," consisting of a score of educators, business men and experienced secretaries.

It is fortunate for some bosses that they are not required to take the C. P. S. examination. For three hours of the 12-hour ordeal, they must take from dictation and type, superlatively well; but that is only the beginning. They must show that they are competent to correct the heinous literary and grammatical errors of their dictators. The remaining nine hours cover everything fit to discuss that

"CHARLIE," by Jim Counts

happens in an office, from filing and communication systems to interpretation of accounting data, payrolls, tax reports, budgets and so on.

There is a two-hour examination on "Personal adjustment and human relations — Problems requiring the exercise of judgment by the secretary in dealing with actual situations involving superiors, colleagues and subordinates." This comes first on the C.P.S. agenda; but we left it to the last because it fills us with dread. It sounds like sugar-coated verbiage for "Techniques for keeping your boss and the lesser males under your thumb." However, as most secretaries are well equipped in that regard, with or without the N.S.A., perhaps it doesn't matter. At all events, if your secretary can hang C. P. S. after her name, she knows her job. You can relax, toss the routine to her and concentrate on improving your golf.

Cerf Versus Bores

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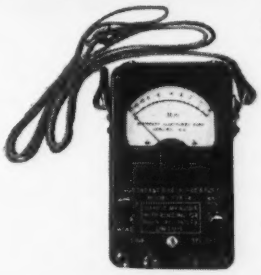

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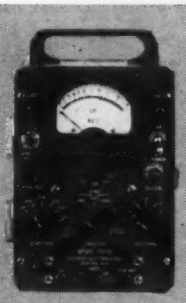

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Markets as of August 29, 1960	DIVIDEND	BID	ASKED	LAST SALE
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Anglo-Canadian Tel. Co. (Br. Col.-Dom. Rep.)	1.20	39	41	
Bell Telephone Co. of Canada	2.20			48⅜
British Columbia Tel. Co.	2.20	47¼	49¾	
Calif. Interstate Tel. (Calif., Nev.)	.70	12½	13½	
Calif. Pac. Util. (Calif., Nev., Ore.)	.90	22½	24½	
California Water & Tel. Co.	1.36	29¼	31¼	
Carolina Tel. & Tel. Co.	1.60	39	—	
Central Elec. & Gas Co.	1.20	26½	28	
Central Tel. Co. (Minn., Ia., N. C.)	.88	24	25½	
Chenango & Unadilla Tel. (N. Y.)	1.20	26	—	
Cincinnati & Suburban Tel Co.	4.50	94½	97½	
Citizens Util. Co. (Calif., Pa.) "A"	stk. only	18½	20	
Citizens Util. Co. (Calif., Pa.) "B"	.48	16¾	17¾	
Commonwealth Tel. Co. (Pa.)	1.00	21¾	23¾	
Florida Tel. Corp.	1.00	25¾	27¾	
General Tel. & Electronics Corp.	.76			29⅝
Hawaiian Tel. Co.	1.00	21½	23	
Independent Telephone Co.	none	8	8½	
Indiana Tel. Corp.	.50	23	26	
Inter-County Tel. & Tel. Co. (Fla.)	.72+stk	26½	28½	
Inter-Mountain Tel. Co. (Va., Tenn.)	.80	15¾	17¼	
Jamestown Tel. Corp. (N. Y.)	5.60	88	—	
LaCrosse Telephone Corp.	.80	15½	—	
Lincoln Tel. & Tel. Co. (Nebr.)	2.60	64	—	
Lorain Telephone Co. (Ohio)	1.40	33	—	
Middle States Tel. Co. (Ill.)	.80	22	25	
Mountain States Tel. & Tel. Co. (Ariz., Colo., Mont., Tex.)	.90			24
New England Tel. & Tel. Co.	1.72			37⅛
North Carolina Tel. Co.	none	1	1⅜	
Northern Ohio Tel. Co.	2.00	53	57	
Pacific Tel. & Tel. Co.	1.14			28⅝
Peoples Tel. Corp. (Pa.)	4.00	78	—	
Pioneer Tel. Co. (Minn.)	1.00+stk	35	37	
Rochester Tel. Corp. (N. Y.)	1.00			23¼
Southeastern Tel. Co. (Fla.)	1.00	23	25½	
Southern New England Tel. Co.	2.20	46	48½	
Southern Nevada Tel. Co.	1.00	25	27	
Southwestern States Tel. Co. (La., Ark., Okla., Tex.)	1.20	24¾	26¼	
Telephone Serv. Co. of Ohio "A"	*	26	30	
Telephone Service Co. of Ohio "B"	*	26	30	
Tidewater Telephone Co. (Va.)	1.40	25	—	
Virginia Tel. & Tel. Co.	1.00	20½	22½	
United Utilities, Inc.	1.40	46	48	
West Coast Tel. (Wash., Ore., Calif.)	1.28	26¾	28¼	
Western Union Telegraph Co.	1.40			48⅜
Western Utilities Corp.	.36	8½	9⅛	
Western Lt. & Tel. Co., Inc. (Mo., Kans., Ia.)	2.00	44	46½	

* Dividend rate on new stock after split not yet established

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stallation. The operating telephone companies and the associations have publicized their willingness to cooperate in every way.

The consensus of the USITA committee was that contacts with architects have been, and are likely to remain, quite ineffective; and the builders of houses have cooperated in only a few scattered instances.

Eventually, some soviet-minded state legislatures will wield the Big Stick and enforce their compliance; then the architects and builders will be the first to howl at the high cost of governmental interference, which reasonable cooperation on their part would have avoided.

Long Distance Weddings

RECENTLY a U.S.A.F. airman married a French girl by long distance telephone. Air Force officials ruled that such a marriage is illegal. Now Virginia's Attorney General Albertis Harrison has come to the rescue. He declares that marriage by telephone is legal, as there is no statutory requirement that the bride and groom shall be in each other's presence. He appears to agree with Samuel Pepys' opinion, written 300 years ago: "Strange to say what delight we married people have to see these poor fools decoyed into our condition."

Pay T.V. vs Commercials

IN ETOBICOKE (not a new drug store drink, but a suburb of Toronto) a Paramount Pictures subsidiary, Trans-Canada Telemeter, is giving "Pay T.V." its first real trial on this continent.

Some 4500 families have paid $5 for a meter hook-up. They pay about $1 each for first-run movies and other "tops," and as much as $2 for exceptional shows. They receive news, weather forecasts and local announcements free, on a separate channel.

It is a popular service. First class entertainment and the complete absence of commercials are bringing success to the venture. It will be carried to other cities in Canada and — if the opposition of the Theater Owners of America can be squelched — in the United States. — *Leslie A. Gritten.*

TRAFFIC LIGHTS

By D. A. PERIGO

General Traffic Supt., West Coast Tel. Co., Everett, Wash.

A PROBLEM: THE PRE-ARRANGED MISUSE OF "PERSON" TOLL CALLS

In many cases the "person-to-person" toll call provides the means for transmitting messages at no cost to the customer.

ABOUT 20 years ago a subscriber said to me, "I'd sure like to know how to beat your long distance classification racket! Every time I place a station call the person I want isn't around and when I use a person call, whoever I want always answers. I can't win!"

As a result of that conversation I passed along a suggestion that we should accept all calls on a Person basis and if the proper person was on the line within a specified time, such as 15 seconds, the Station rate would apply. If it took longer the Person rate would be used. This method, of course, meant an additional stamping of the ticket or entry of the start time. Twenty years later it is perfectly apparent my suggestion did not win much acclaim — and now, of course, DDD eliminates the possibility.

Toll rates are quite a subject to discuss because so many departments, commissions, etc., get into the act — and there seems to be very little unanimity of thought.

Personally I *think* we are losing money on our Person traffic. Here are a few of my reasons: —

(1) According to the latest toll coefficients it takes about two and one half times as long to complete a short haul person call as it does a station (initial attempt only), about twice as long on a medium haul, and about one and three quarters on a long haul. Look up the figures for yourself. (The coefficients can be translated into costs by using your own rates of pay — but be sure to include all of the fringe benefits that go along with the pay.)

(2) Where station traffic is automatically ticketed the difference is even more pronounced. (If it isn't you should not have DDD.)

(3) The WH attempt where word is left for the called party to return the call is even more costly because it involves 2 operators instead of 1.

(4) The handling of person traffic in a small operating unit, with the easy to handle station traffic on DDD, increases the cost due to inefficiency. This is caused by the long work time per call which also leaves more idle time due to the fact that ordinarily calls are not evenly spaced.

(5) Calls which take twice as much operator time also require twice as many switchboard positions for busy hour traffic.

(6) Person practices make it possible for customers to cheat us at every turn. Person calls provide the means for transmitting messages at no cost to the customer. Just casual observation indicates there is more widespread abuse now than there was before some large users were found guilty of "misuse."

An Unfair Situation

IT SEEMS reasonable to assume that if person traffic does not pay its way it is being subsidized by the station traffic — which raises a serious question about the fairness of the situation.

To the best of my knowledge any action which has been taken on the misuse of toll has been in connection with business subscribers — and yet we have good reason to believe that our residence and coin box users give us the greatest amount of trouble.

Actually our methods of handling toll are based on the honesty of our customers. This raises a good moral question — which some might not wish to raise — namely, have our morals slipped to the point where it is considered fashionable to cheat, chisel, and lie?

It seems strange to me that cut-

overs to operator identified DDD generally bring along an increase in adjustments for subscribers who claim no such calls were made from their telephones or we wind up with a lot of write-offs where calls are charged to vacant levels or vacant numbers. I can't believe these are caused by operators who previously had so few errors. Frankly, I am convinced that primarily the problems are caused by those who like to see what they can get away with.

Many companies are making efforts to get their business subscribers to use station calls instead of person (so they can be dialed). The subscriber's message tickets are analyzed to prove the customer would save money by so doing. Even where no effort has been made to do this there is an increasing percentage of station traffic.

Definite Action Needed

MAYBE it is time for us to take definite steps toward the elimination of person traffic completely. There are several ways of doing it. One, which would be the frank and honest facing of the facts, would state that we cannot afford to give person service due to the cheating that takes place.

Another way is to make the price prohibitive, particularly with a minimum charge for the service. Still another way would be to make it gradual, such as eliminating it up to a thousand miles as a start. (The effect of this would be quite different in Lincoln, Nebraska than it would in either Portland, Maine or Portland, Oregon.) And yet another way could be the re-establishment of Report Charges. If this were done it should be high enough to make it worth while, such as one half the station rate.

Has anyone made a recent analysis to determine *the need* for person calling? I wonder if there is a real need anymore.

While we are about it let's ask some questions about other toll services. How much are we being cheated by the Credit Card plan and the practices being followed? In this case we probably get a lot of business from those who have Credit Cards — our problems are with those who don't have them, but use the plan anyway.

The third number call also creates some headaches for our Business Office friends.

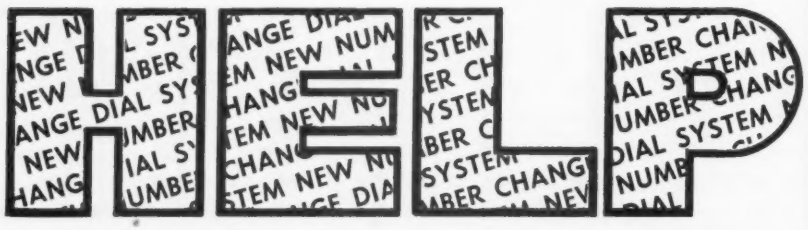
The unfortunate part of all these items is that the honest person with high moral standards is the one who pays the bill. This seems to be our way of life. Who pays the bill to support the criminal courts, our penal institutions, and our police force? Not the criminal — but the honest man. Who pays the bill for the poor risk who is extended credit? Not the fellow who walks out on his obligation but the fellow who has his monthly payment in on time every month. And, of course, *our* honest customers pay for those who cheat *us.*

I bring this point out because I have heard a lot of telephone people say that changing some of our practices would insult our honest customers. Well, our banks have a lot of honest customers — but they don't leave their vaults open all night. They are protecting their honest customers — and I, for one, think it is high time we in the telephone business start protecting our honest customers.

One of the ways we can protect them is to eliminate our person calls and another way is to provide positive line identification when placing toll calls of any kind.

Does anyone know of any way (other than the pre-arranged misuse of person telephone traffic) to get a message across the country quickly at no cost? — *D. A. Perigo.*

Any comments, criticisms, or suggested subjects for future topics? Address all correspondence to "Traffic Lights," Telephone Engineer & Management, 7720 Sheridan Road, Chicago 26, Illinois.



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Pacific Telephone and Telegraph
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THE WASHINGTON BEAT

By ROLAND DAVIES and FRED HENCK

WASHINGTON OBSERVATIONS

Witnesses for Ohio Bell continue to hold to basic views on application of Charleston and modified Phoenix plans to Independent settlements in continued hearings on toll compensation complaint of Ohio General.

IN CONTINUED hearings in Columbus August 23-25 on the toll compensation complaint of the General Telephone Co. of Ohio against Ohio Bell, witnesses for the Ohio Bell Telephone Co. continued to maintain the basic views that (1) the Charleston separations plan should not be applied to settlements for Bell System-Independent interchanged interstate traffic; (2) the modified Phoenix plan should not be applied to Independents' property; and (3) digit absorbing equipment should be considered as allocable to exchange operations.

Five of the nine Ohio Bell witnesses who gave direct testimony late in July were cross-examined by General of Ohio Counsel John Robert Jones at the August sessions. The remaining four Bell spokesmen, who discussed the study of mileage of General of Ohio exchange circuit plant made by Ohio Bell under an order of the commission, will be questioned at the next session, scheduled to begin Tuesday, Sept. 20, and run the remainder of that week if necessary.

At the request of Ohio Commissioner Everett H. Krueger, Jr., who presided at the sessions, American Telephone & Telegraph Co. Separations Engineer Merton A. Lish summarized Ohio Bell's differences with General of Ohio in the case as follows:

(1) In a territory such as General of Ohio's, with its high proportion of single-office exchanges, the use of the "Charleston assumption" — equal mileage of exchange circuit plant used in both exchange and toll service — is not "consistent with the facts," and the "introduction of the mileage element" into the allocation of exchange circuit plant, by means of a study, is necessary. Otherwise, he told Commissioner Krueger the Charleston plan of separations is applicable to Bell-Independent settlements, and may be used.

(2) The modified Phoenix plan was developed for use by the Bell System associated companies to arrive at an allocation of Bell System plant in a particular state consistent with the allocation which would occur if that plant were to have been owned by a single corporate entity, and Independents' plant should not be included in the averaging or "commingling."

(3) Digit absorbing equipment installed in local exchanges is used in making exchange connections, and not toll connections, and should be allocated, along with all the other selectors in the local exchange plant, on the basis of minutes of use of local dial equipment.

Questioning of Mr. Lish and former New York Public Service Commissioner Spencer B. Eddy, who was a member or Chairman of the National Association of Railroad & Utilities Commissioners' Special Telephone Committee during most of his service on that regulatory body, occupied most of the three days of hearings.

Following completion of the questioning of the Ohio Bell witnesses at the next session, it is anticipated that General will offer rebuttal testimony. Particularly if Ohio Bell then introduces rebuttal evidence of its own, the hearings are not expected to wind up until November. As a result, especially when time for filing briefs is considered, it is clear that the Ohio commission will not be able to issue a decision until at least early next year.

Witnesses cross-examined last month, in addition to Mr. Lish and Mr. Eddy, were C. M. Rankin, assistant vice president of Ohio Bell; William H. Wallace, Independent company relations manager; and William H. Elstun, Independent company relations supervisor.

At the outset of his questioning by General of Ohio counsel Jones, Mr. Eddy agreed that during his years on the NARUC Special Telephone Committee, there was a "continual" decline in intrastate earnings, and consequent increases in intrastate toll and exchange rates. At the same time, he noted, interstate telephone earnings rose, and there were some reductions in interstate rates.

Mr. Eddy, in reply to another question, described separations as a "contributing cause" of the disparity in state and interstate toll rates, and he pointed, in response to another inquiry by Mr. Jones, to the "almost continuous work" on separations improvements during that period.

The witness commented that the separations changes of recent years have been based on use, and he agreed that the changes were intended to apply to the entire telephone industry, with some modifications as

"spelled out" in the separations manual. Mr. Eddy told Mr. Jones that disparity is not, "strictly speaking," a separations problem in and of itself, but he testified that separations methods are a "very important contributing factor" in disparities.

Mr. Jones cited several cases from the 1930s in which state commissions ordered state toll rates to conform to the interstate schedules, and asked if the disparity problem could not be solved without reference to separations. Mr. Eddy said it could, "If you want to rob Peter to pay Paul."

The General of Ohio attorney indicated that last year's action by the FCC reducing interstate rates by $50,000,000 had no effect on the disparity problem, because the reductions were applied only above 469 miles, and Mr. Eddy agreed that generally the FCC-negotiated reduction did not affect intrastate-interstate disparities. Mr. Krueger later asked if there was not actually some effect, in instances where the interstate rate for a 500-mile call might have been pushed below an intrastate rate for a shorter distance, and Mr. Eddy conceded that this could be true.

The former New York Public Service Commissioner agreed with Mr. Jones that when disparity is discussed, what is actually being referred to is a disparity between state and interstate earnings. He also agreed with Mr. Jones that the disparity problem includes the effect on exchange rates as well as intrastate toll, in that "if you don't get the money in one place, you have to get it in another."

In reply to additional questions by Mr. Jones, Mr. Eddy said that the 1942 NARUC separations procedures provided for the allocation of exchange circuit plant on the basis of minutes of use of subscriber lines, and that this was revised as the "shortcut" method of using message-minutes, in the 1952 Charleston plan. The 1952 approach was incorporated in the 1957 manual, it was pointed out.

Mr. Eddy, continuing his testimony, declared that his opinion is that the manual cannot be used to

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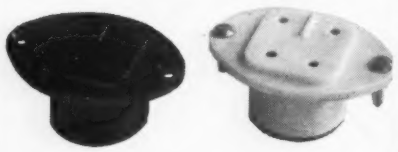

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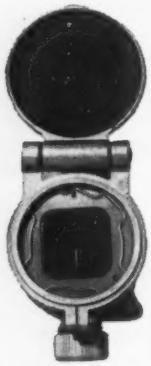

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make separations between exchange and intrastate toll, or between exchanges or special services, without further refinements. There may be special circumstances where the manual could be employed in its present form, he declared, but a study would be required to see if the manual could be used. Once the study was available, he added, "it would be better to use it, rather than the manual, anyway."

Mr. Jones noted the manual's language that further modifications "may be required" to use it for exchange-intrastate toll separations, and Mr. Eddy said the use of that phrasing was "deliberate" in order not to "pass on a controversial issue" and to give freedom of action to the states. He said some of the members of the manual task force were in favor of providing for three-way separations (interstate-intrastate toll-exchange), but that a "great many of us" were opposed to this view, and that the manual's language, therefore, was a compromise.

The General attorney commented that the manual does not say that it was intended only for jurisdictional separations, and Mr. Eddy replied that the document cites that another simplification was the use of message-minutes to separate exchange circuit plant between interstate and state tolls. He described this as "another clear indication" that it was intended purely for jurisdictional separations purposes.

Mr. Eddy agreed that an Independent company making a separations study for jurisdictional purposes should use the manual, except under unusual circumstances, but he reiterated that the manual could not be employed as the basis for settlement of interstate toll revenues. Separations has to be the first step in settlements, Mr. Eddy went on, but he said that separations made in two companies could be used without adjustment for settlements only if both companies' circumstances were identical.

In further testimony, Mr. Eddy continued to express the point of view that the separations manual cannot be used without change for settlements unless a study is made to determine if the companies' circumstances are comparable. In situations involving the "inherent distortion" between single-office and multi-office exchanges, a study should be made to see if use of the manual would be proper, he went on. But once the study has been made, it might as well be used for settlements, he declared.

Mr. Jones asked if the distortion is not also present in jurisdictional separations, and raised the question as to how the manual can be used properly in that area if it cannot be employed for settlements. Mr. Eddy replied by giving an example of two companies which are of the same size, and have the same percentage of plant allocable to interstate, but one is on a reproduction cost value basis and the other is on original cost. In that instance, he continued, the percentage applicable to interstate is what counts in jurisdictional separations, but if the manual is used for settlements, the reproduction cost value company "gets by all odds the best of the deal."

The General attorney then pointed out that the FCC is on an original cost basis, and that the subject under discussion was settlements of interstate traffic, but Mr. Eddy continued to maintain his basic position.

Early in Mr. Lish's cross-examination by Mr. Jones, the General attorney brought up previous questions to Mr. Lish about the use of the 1957 separations manual to determine the settlement of interstate calls in Bell-Independent interchanged business. The AT&T official said that his personal opinion is that such settlements may be based on the manual, but not because the manual's methods necessarily produce the proper results.

Rather, he declared, it is necessary to recall that after the Charleston plan was adopted, the U. S. Independent Telephone Association came to the Bell System to urge the use of the "Charleston assumption" — the 1-1 ratio between use of exchange circuit plant for exchange and toll use — in settlements and the Bell System representatives concluded that equality of mileage use is not present generally.

However, Mr. Lish went on, the

Bell System spokesmen later agreed "as part of a whole package on settlements" to apply the Charleston plan in interstate settlements. He feels, he declared, that the use of the 1957 manual for interstate settlements is proper only as a result of the overall compromise agreement which was reached.

The witness told Mr. Jones that he feels the Charleston plan overstates the use of the Independents' part in handling interstate business. The same thing applies to its use for jurisdictional separations, he continued. But it was felt, he said, that it is extremely important that consistent jurisdictional separations methods be used, and since the FCC and the states agreed on the Charleston plan, it should be employed in jurisdictional separations, even if it does not give the true costs involved.

At the opening of the Wednesday session, Mr. Jones opened a line of inquiry later developed at some length by Mr. Boritzki, when he inquired how a mileage study could be useful in measuring the use of telephone instruments and similar station equipment. Mr. Lish replied that the measurement of category A equipment, including instruments, has to be viewed as a whole, even though some other method of measurement might be appropriate for its components if "you tear it down into its piece parts." He agreed that the Ohio Bell mileage study would not determine the use of one-third of category A plant, "viewed by itself."

Much of the remaining testimony at the Wednesday session dealt with the allocation of digit absorbing equipment, installed at local exchanges when they are converted to 2-5 numbering for direct distance dialing so that the first three digits are "absorbed" when intra-exchange calls are made. Broadly, it is General's position that this equipment would not be installed in smaller exchanges except for conformity with the nationwide d-d-d numbering plan, and that therefore it is solely attributable to toll operation. Ohio Bell takes the position that the digit absorbing equipment is used only in connection with local service, and

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should be allocable to exchange operations.

Mr. Elstun, whose direct testimony encompassed the message toll settlement agreements recommended for Bell-Independent business by officials of AT&T and the U. S. Independent Telephone Association in 1956 and 1959, said that cost study procedures followed at selected Ohio exchanges before the nationwide recommended patterns were agreed to were intended to get a "reasonably accurate picture" of average Independents' costs on a national basis.

Mr. Jones' line of questioning of Mr. Elstun was as to whether the final agreements provided more for the Independents than the cost studies themselves indicated. Mr. Elstun said he did not know, but assumed that they did, since certain items were "appliqued" on top of the cost study results.

Discussing the respective shares of General and Bell for interchanged traffic, Mr. Jones brought out that since General's settlements are based on sent paid and received collect calls in its territory, Ohio Bell's share is the balance after deducting General's payment for traffic billed General customers, plus the entire amount of revenue to Bell customers.

In brief cross-examination of Mr. Wallace, who had discussed situations where toll compensation payments to General exceeded the average revenue per message accruing to Ohio Bell, Mr. Jones brought out that all of Mr. Wallace's examples related to short haul traffic. Mr. Wallace agreed that the picture would be "changed" by an undetermined amount, if long haul calls were used as examples in his testimony.

The final witness, Mr. Rankin, told Mr. Jones that he "doubts" that Ohio Bell would "grant the benefits" of the modified Phoenix plan to General of Ohio today, on the basis of the mileage study made in the proceeding.

Mr. Rankin was questioned at some length on Ohio Bell's insistence on a prestudy agreement before a joint cost study would be made by the two companies. The discussion covered events which took place principally before General of Ohio cancelled its toll settlement agreement with Ohio Bell. Mr. Rankin was unable to answer many of the questions raised, since "we never got the (prestudy) agreement."

At the conclusion of the session, Mr. Jones asked for an "authoritative" statement from an Ohio Bell officer as to whether it is the company's view that the Charleston plan should not be applied to settlements with General on Bell-Independent interstate traffic.

Ohio Bell General Counsel Ashley M. Van Duzer replied that General of Ohio, in his company's view, is not "entitled" to the Charleston plan principle application either on intrastate or interstate traffic. That, he declared, is Ohio Bell's position, "has been, and will continue to be."

Almost two centuries of continuous telephone experience are represented in this picture of Warsaw general office employes of United Telephone Co. of Indiana, Inc. receiving service pins. Shown above are (l. to r.): DALE GRAHAM, buildings engineer, 10 years; GLENN CARPENTER, auditor, 30 years; G. A. STEELE, president, 30 years; H. D. CLINGENPEEL, commercial superintendent, 30 years; JOSEPH MILLER, cable supervisor, 25 years; T. A. DANIELSON, vice president, 35 years; and CECIL BURRIS, plant superintendent, 30 years.

Don G. Mitchell and Dr. A. D. Holt Will Address Annual USITA Convention

IN KEEPING with the United States Independent Telephone Association's traditional policy to obtain for its annual fall convention outstanding speakers of national reputation, members of the Washington staff are busily engaged in preparing for the program of the 1960 convention to be held in Chicago on October 9-10-11-12, at the Conrad Hilton Hotel.

Among the first to accept an invitation to address one of the great gathering's general sessions is Don G. Mitchell, president of General Telephone & Electronics Corp., and chairman of its subsidiary, Sylvania Electric Products, Inc.

Mitchell is recognized as one of the industry's leading authorities on corporate organization and policies, especially in the broad areas of scientific marketing and human relations. A member of the Sylvania organization for 17 years, Mitchell was elected president and a director of General Telephone & Electronics Corp. when Sylvania merged into General Telephone Corp., the country's largest Independent telephone system.

Mitchell has had a meteoric career in the business world. When he joined Sylvania in 1942, the company's sales that year were $32 million. Sylvania sales now exceed the annual rate of $400 million. Born April 26, 1905, he attended the University of Cincinnati and the University of Florida and subsequently was associated with several large industrial corporations in various executive capacities, including McGraw-Hill Publishing Co., Niagara-Hudson Power Co., American Can Co., Marshall Field & Co., and Pepsi-Cola Co. He left Pepsi-Cola in 1942 to join Sylvania. He is at present a member of the board of directors of a score of the country's larger business organizations.

Frequently sought as an advisor by government bodies, Mitchell was appointed advisor on electronics to the Under Secretary of Air at the start of the defense program which followed the outbreak of the Korean War. During Paul Hoffman's direction of the Marshall Plan for European Relief, he was chairman of an unofficial advisory group of industrialists. He also served as a member of the Advisory Council to the Senate Committee on Trade Policies. He has been a director of the National Association of Manufacturers and the National Sales Executives.

DON G. MITCHELL, pres. of General Telephone & Electronics Corp., New York City, will address the final general session of the USITA convention.

Don G. Mitchell is a gifted speaker of national stature and reputation, and he will add lustre to the closing general session of the convention on Wednesday, October 12, in the Williford Room at the Conrad Hilton Hotel.

Dr. A. D. Holt, president of the University of Tennessee at Knoxville, renowned educator and author, will give the traditional inspirational closing address as the wind-up speaker of the USITA convention.

Dr. Holt, whose topic will be "How To Be A Cobalt Bomb," is a nationally known figure who has devoted a lifetime to education, having run the gamut from a high school athletic coach to his present position as president of one of the country's great universities. He is a former president

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of the National Education Association and is a life member of the National Congress of Parents and Teachers.

Dr. Holt is the author of a book, "Struggle For A State System of Public Schools in Tennessee," and has contributed numerous articles to various educational publications. He is recommended as a speaker who will stimulate our thinking and who will inspire us as only men of his caliber can inspire their listeners.

DR. A. D. HOLT, pres. of the University of Tennessee, Knox, Tenn., will deliver the closing address at USITA's 1960 convention.

USITA Executive Vice President Clyde S. Bailey advises that other speakers of exceptional ability will address both the general sessions and the usual technical conferences, and that there will be no lack of the customary social and entertainment activities, including the association's annual banquet, always a highlight of this great gathering of the men and women of the Independent telephone industry.

Meanwhile, the various manufacturers of equipment and supplies are preparing their exhibits which will completely occupy the fifth and sixth floors of the world's largest hotel, and which are always an outstanding attraction of the convention.

The names of other speakers and additional program details will be announced in the October 1 issue of *"Telephone Engineer & Management."*

New Products' Showcase

SUPPLIES And EQUIPMENT

By Dick Reynolds

Distribution Wire

A NEW jacketed-pair distribution wire is being introduced to the telephone industry by Whitney Blake Co.

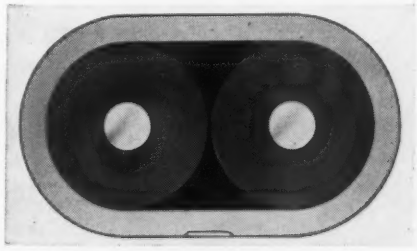
New design features an extra-heavy wall of REA approved PVC compound extruded over each pair of No. 19 or No. 22 AWG annealed copper conductors. The conductors are insulated with a tough high-density polyethylene.

Each jacketed pair is color coded by two colors, an over-all color and a stripe that is an integral part of the jacket. The over-all color corresponds to the "ring" color, while the stripe corresponds to the "tip" color of REA Specification PE-15.

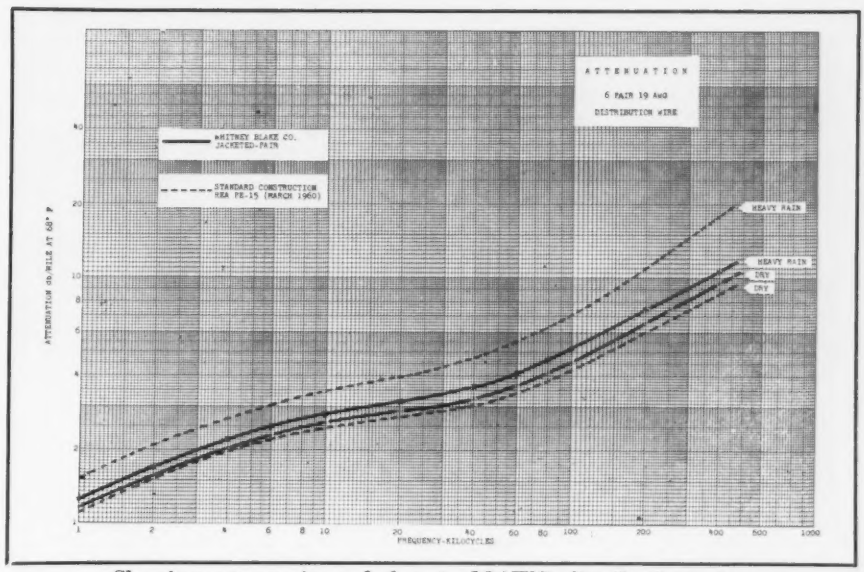
In assembling, the jacketed pairs are twisted around a polyethylene-covered extra high strength .109″ or .134″ galvanized steel messenger wire.

Cables of 6 pair or less are twisted directly around the messenger. Cables with more than 6 pair are twisted together in groups and these groups, in turn, twisted around the support wire.

Toughness is provided by the extra-heavy jacket and high-density polyethylene insulation which enable the cable to withstand unusual physical abuse. This same jacket, together with special design features, has reduced attenuation changes from dry to wet to a minimum. In addition, the single two color jacket over pairs makes identification easy; all pairs in all size cables are readily accessible, as the pairs are so twisted that each pair appears on the outside at frequent intervals. *Check NP* 508.



Enlarged section of one pair.



Showing attenuation of 6 pair 19AWG distribution wire.

Radio Paging System

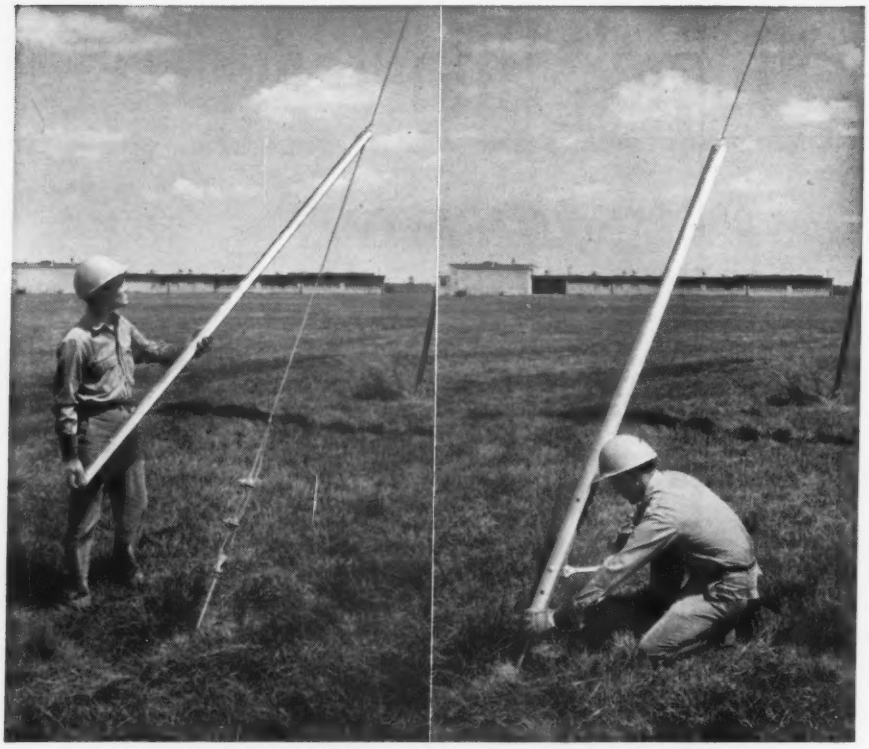
A PERSONAL radio paging system, capable of providing selective voice communications to more than 7,500 persons, has been developed by Motorola.

The new system, which operates on standard mobile radio VHF frequency bands (25-54 mc and 144-174 mc), enables one-way communications between a central base station and individuals carrying compact "Handie-Talkie" Radio Paging Receivers. When an individual is paged, an alerting tone sounds in his receiver. The voice message follows. Private communications are maintained since no other paging receiver is alerted.

The fully transistorized FM receiver provides 500 milliwatts audio output, enabling reception even in noisy locations. The radio pager operates from either a rechargeable battery or mercury cells. The rechargeable nickel cadmium supply provides up to 12 hours operation with each charge. The replaceable mercury cells last up to 120 working hours.

The entire receiver weighs 14 ounces and fits clipped in a pocket or on a belt. The receiver accommodates an external antenna.

For low capacity systems, a desk-top pushbutton control console is



If they're Easy to Install... they're Easier to Get Installed

The Chance 808 Guy Guard is the simplest guard of all to install. It hooks on the top of the guy, bolts on the bottom. The tight-holding top hook slips over the guy wire without the groundman stretching... holds the guard away from the wire to eliminate noisy vibration. The single bolt at the bottom fastens the guard to the guy rod, the guy wire, or the guy loop. Groundmen like the way it goes up easily... don't balk at installing guards where and how you want them. Available in 7 and 8 foot lengths in galvanized steel, the Chance 808 Guy Guard has turned-in edges that give it added strength, make it safer.

Where you need guards that must fit over U-bolt-type clamps, use Chance Tapered Guy Guards. Their single, low Mono-Bolt Clamp makes installation simple. The top of the guard fastens to the guy wire with a tight-gripping V-block clamp. Guards come in 8-foot lengths, have full round construction. Fit any size rod from ½" to 1¼", and are made of hot galvanized steel for long life.

For complete details on all Chance Pole Line Hardware, refer to the Chance Catalog and Pole Line Hardware Cross Reference Guide.

ABC INDUSTRIES

A. B. CHANCE CO.
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CG60-26

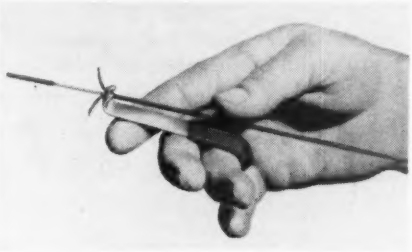
utilized with a regular two-way radio base station. The tone generators are included in the console. Up to 90 calls are provided with each console. Four consoles can be used in a single system, permitting up to 360 calls.

A separate tone generating console is utilized for higher capacity systems along with a two-way radio base station and pushbutton control unit. Stations providing up to 250 watts RF power output are available. The station can generate up to 7,656 individual calls. *Check NP* 509.

Insulation Stripper

A NEW insulation stripper for telephone installers has been developed by Tronco, Inc.

A tool, with no moving parts, the Tronco insulation stripper works with all types and gauges of plastic insula-

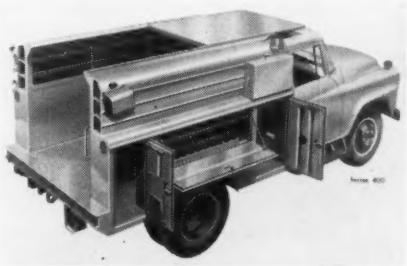


tion. It is designed to remain attached to the installer's hand throughout a complete wiring phase. Vinyl covered handle bends to fit snugly to installer's finger. *Check NP* 510.

Line Construction Body

McCABE-POWERS Body Company has announced the production of the 1960 version of its Series 400 Line Construction and Maintenance Body.

Standard body equipment includes all shelves and parts bins, material hooks in forward compartments and



cargo area, pike pole carrier, extended winch shaft opening in curbside front door, recessed slam-action latches with keyed-alike locks, door

Open Line Wire & Messenger

4

Preformed TRADEMARK **COMMUNICATIONS TIES**

are the handiest, fastest way of making a "GOOD TIE." They refuse to be applied incorrectly; installed without tools; offer uniformity of all completed assemblies; positive holding. Made in Copper-Covered Steel and Galvanized Steel for specific combinations of insulators and line wire sizes.

5

Preformed TRADEMARK **DEAD-ENDS**

offer a fast, tool-free, inexpensive way to
nate stress points which cause fatigue fail
with the line wire—Galvanized Steel and

7

Preformed TRADEMARK **PLASTIC SPACER UNITS (PSU)**

eliminate midspan hits and offer an economical solution for constructing longer spans with extra-high-strength wire. Made of high impact polyvinyl chloride for 5″, 6″, 8″, 10″ and 12″ spacing; other sizes to order.

8

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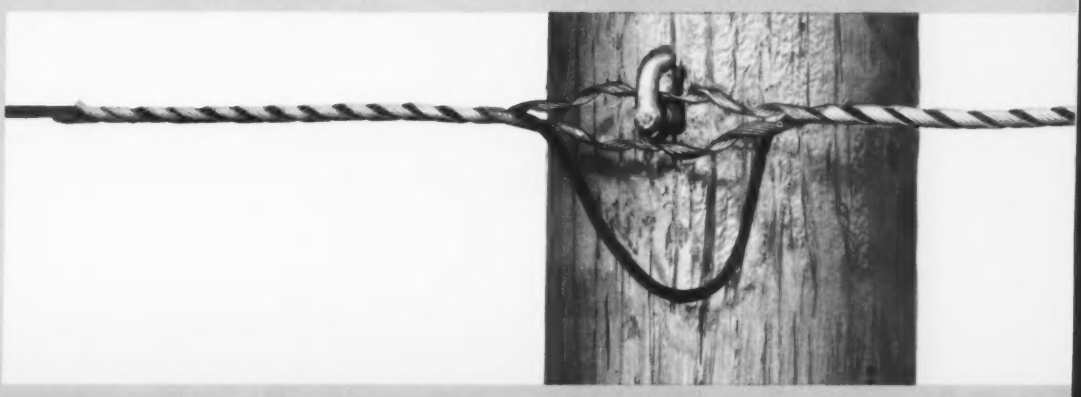
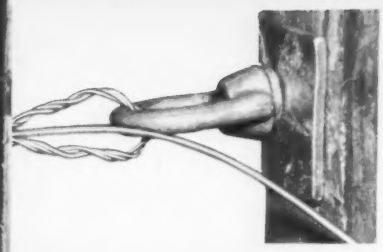
One-Pair Aerial Distribution Wire (C-Rural)

11

Preformed TRADEMARK **STANDARD LOOP AND ELONGATED LOOP TANGENT SUPPORTS**

offer the safest, fastest suspension method for one or more one-pair Aerial Distribution Wires (C-Rural) on a common drive hook. Made of Stainless Steel, Neoprene-Coated, for 2 No. 14, 2 No. 12 Copper-Covered Steel and 2-.083 Steel wire.





dead-end open line wire. They elimi-
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opper-Covered Steel.

6

Preformed TRADEMARK **SPLICES**

repair abraded or severed line wire at tie points and mid-span, restoring full strength and conductivity. No tools needed—no wire cutting. Provide armor protection at tie points. Made in materials compatible with Galvanized Steel and Copper-Covered Steel line wire.

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TIC PINCH
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PLASTIC VIBRATION DAMPERS (PVD)

reduce fatigue damage from vibrating open line wires. Non-traveling; one size fits all open line wires.

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SPLINT & TIE ASSEMBLIES

minimize wear and prolong the life of line wire. Made of Galvanized Steel and Copper-Covered Steel.

Preformed TRADEMARK

CROSSARM TANGENT SUPPORTS

cradle C-Rural wire to protect against contact with crossarms. For use where climbing clearance is required, or to provide ground clearance.

12

13

Preformed TRADEMARK **DEAD-ENDS**

. . . the sure, least expensive way to dead-end one-pair aerial distribution wire. Used in conjunction with Preformed C-Rural Tangent Supports, they provide a unique method of suspension. Made of Stainless Steel, Neoprene-Coated. Firm, cushioned grip distributes pressure uniformly.

Rural Distribution Wire (B-Rural)

14

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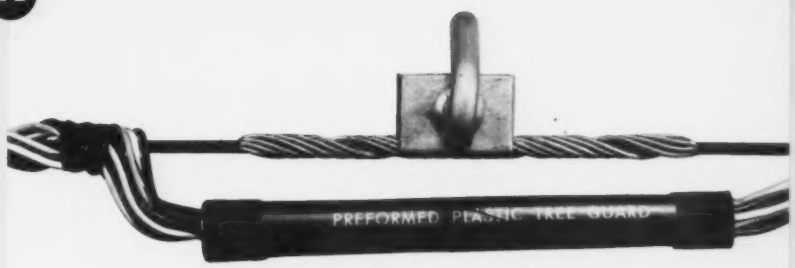
GRITTED ARMOR RODS (ADAPTERS)

increase the diameter of the messenger and protect it from abrasion caused by attachment of D span clamps or wire splice terminals.



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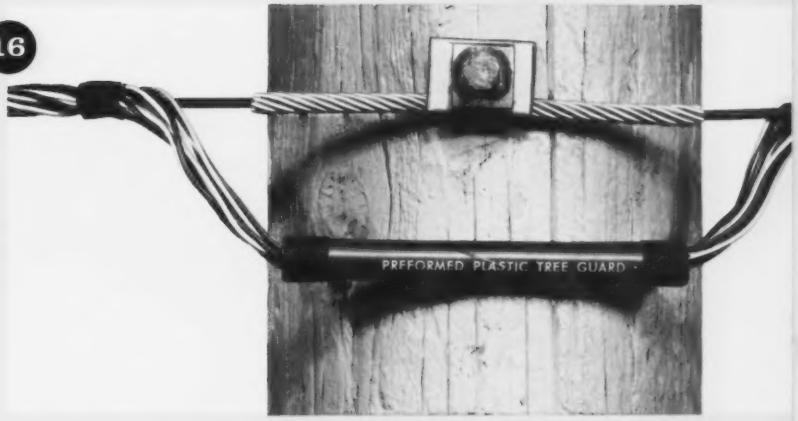
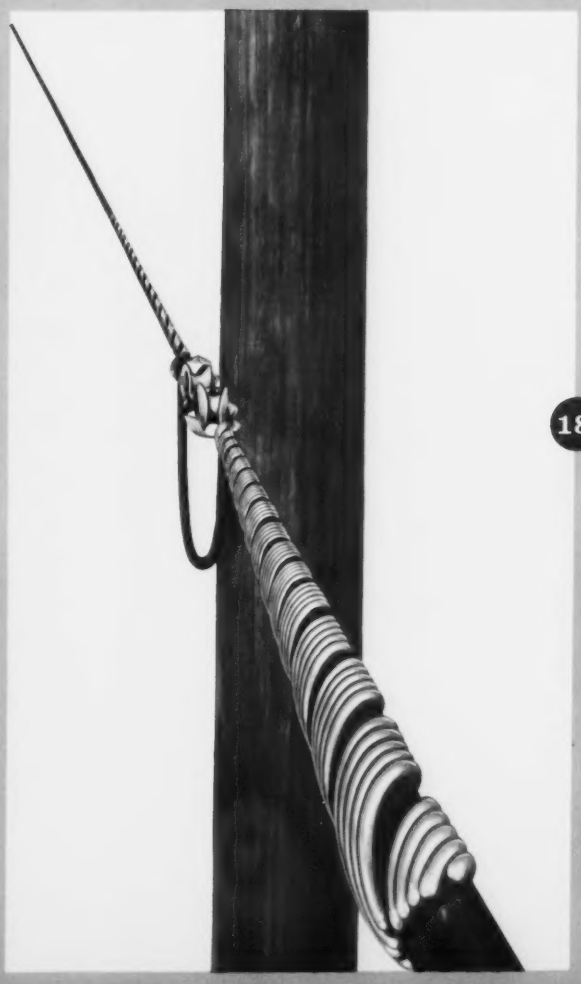
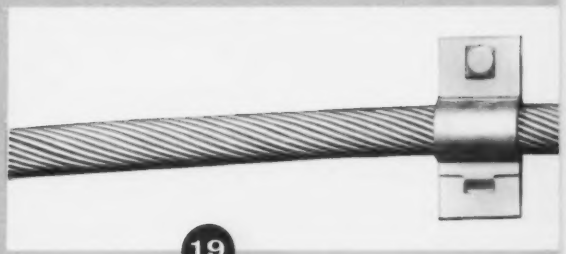
ALUMINUM ALLOY ARMOR RODS

with One-Bolt Clamp eliminate expensive J-Hook installations. Protect insulated messenger from clamping stresses; increase holding power. Applied over insulated line wire.



Plastic-Covered Self-Supporting Telephone Cable





19

Preformed TRADEMARK **ALUMINUM**

SUPPORT CLAMPS . . . used in to suspend jacketed cable.

18

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PLASTIC-GRIP DEAD-ENDS

the only way to secure covered conductor safely and permanently.

Drop Wire

Prefor TRADE

eliminate reuse. Ma

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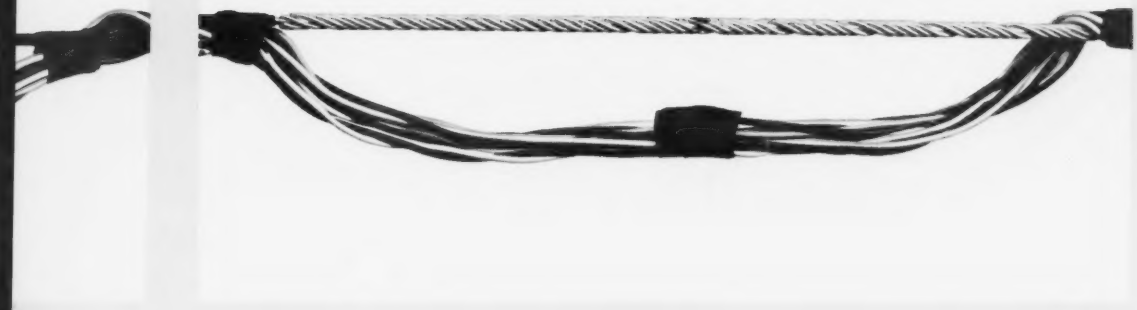

15

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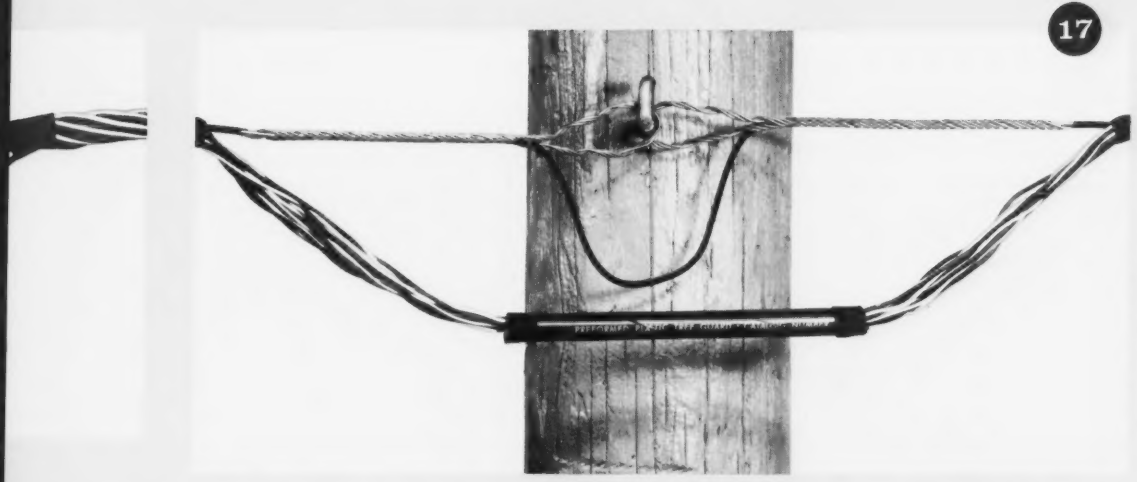
SPLICES

. . . the fast, economical way to join stripped messenger of B-Rural wire. Applied by hand. Hold full-rated strength of the messenger.



17

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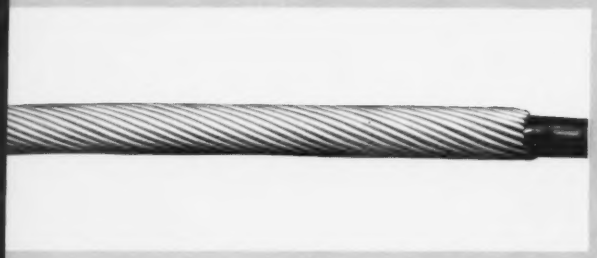
DEAD-ENDS

permit economical dead-ending of stripped messenger without cutting the messenger wire. They eliminate stress points which cause premature fatigue failure; hold full rated strength; easy hand application; can be reused.



ALLOY LINE GUARDS and GALVANIZED STEEL TANGENT

combination with Preformed PLASTIC-GRIP DEAD-ENDS

20

med **DROP WIRE DEAD-ENDS**

bail failures and prevent stripping of the insulation. Easily removed for
de of Stainless Steel, Neoprene-Coated.

Check here for more information

Please send full particulars on the following checked (✓) items:

1		5		9		13		17	
2		6		10		14		18	
3		7		11		15		19	
4		8		12		16		20	

NAME_____

TITLE_____

COMPANY_____

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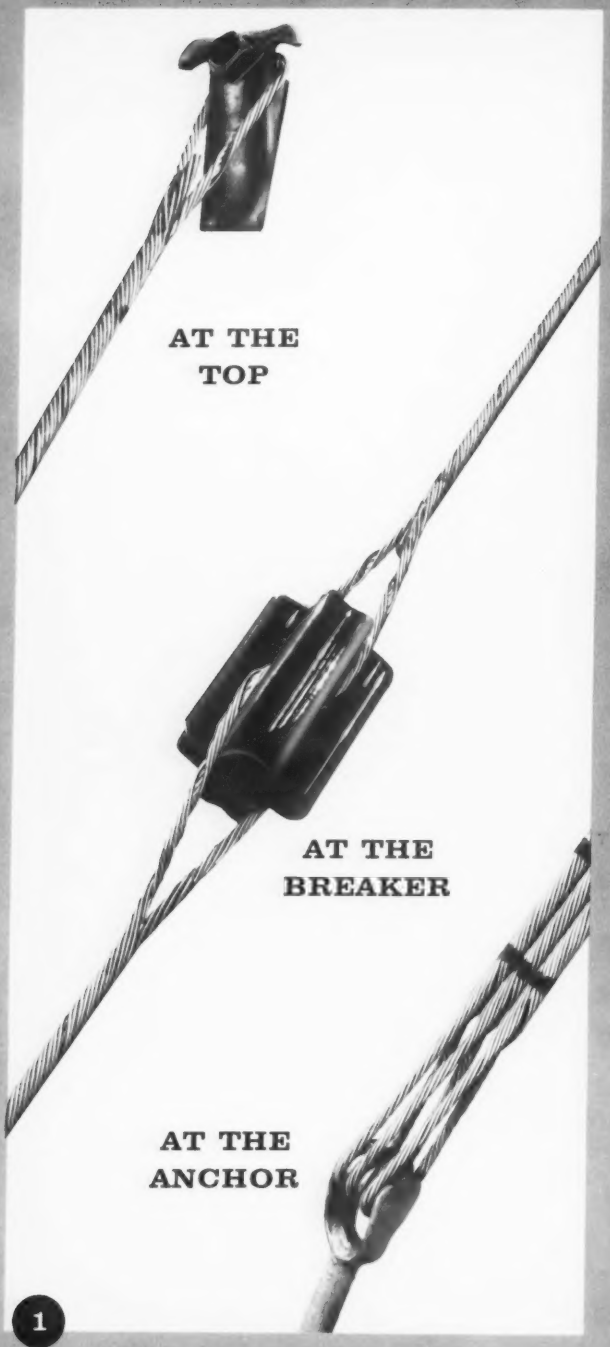
CITY_____ ZONE____ STATE_____

AND MAIL TO:

PREFORMED LINE PRODUCTS COMPANY

5345 St. Clair Ave., Cleveland 3, Ohio

Guy and Messenger Strand



1

GUY-GRIP TRADEMARK **DEAD-ENDS**

are offered for all sizes and materials of guy and messenger strands. Now available in Open Helix and Cabled Loop designs. GUY-GRIP dead-ends are fast, safe, and easy to wrap on by hand; hold 100% of the R.B.S. of the strand to which they are applied.

Order your *Preformed* TRADEMARK telephone products from the local dealer of your choice.

Preformed TRADEMARK telephone products are distributed by your leading LOCAL and NATIONAL TELEPHONE SUPPLIERS:

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The products in this folder are manufactured under one or more of the following: U.S. Patent No. 2,761,273; 2,744,707; 2,609,653; other patents pending.

Fast easy tool-free uniform attachments with *Preformed* TRADEMARK telephone line accessories for new construction or repair and maintenance

You can look up to Preformed TRADEMARK

is a trademark which is registered in the U.S. Patent Office and is the property of Preformed Line Products Company.

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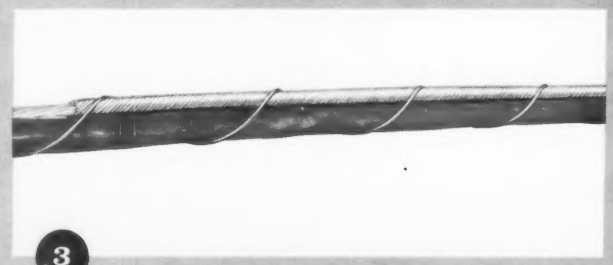
2

Preformed TRADEMARK **STRAND SPLICES**

. . . restore full mechanical strength to damaged or severed guy and messenger strand. You can see at a glance that they are installed correctly. Permit the spinner to travel over the splice without adjusting the gates or lifting the spinner over the splice.



3

Preformed TRADEMARK **LASHING RODS**

economically secure cable to messenger. No rings, clamps, or other expensive equipment required. Installed without tools; remove and reuse if desired.

See
all-product
spread inside

safety catches and nylon bushing in each door hinge.

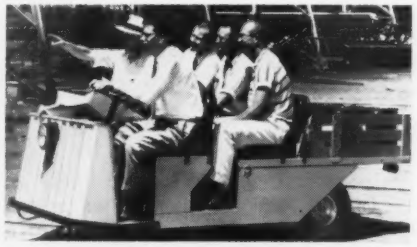
Body is thoroughly steam cleaned, sprayed with liquidized iron phosphate to resist corrosion and coated with red oxide primer before painting in the color or colors desired.

Series 400 Bodies are 104″ long, 85″ wide and 64″ high, with 56″-wide cargo area and 14½″-deep compartments. Body is designed for installation on chassis having dual rear wheels and cab-to-axle dimension of approximately 60″. *Check NP* 511.

5-Passenger Electric Vehicle

CUSHMAN MOTORS has announced availability of a new model of its 3-wheel electric Truckster for transporting industrial personnel.

Called the Cushman 734 Truckster, unit will carry four passengers, an operator, and also has a 45⅝-in. by 41½-in. flatbed with stake racks. This model is rated at a 1000-lb. payload capacity plus the operator and one passenger. The unit will operate in passageways as narrow as 50 in. and will deliver up to 50 miles without recharging. The unit's rear seat is removable to allow space for transporting additional equipment.



A speed selector switch offers two forward speeds and one reverse speed. The speed is further controlled by an automotive type controller pedal to start and stop the vehicle. The truckster with a personnel carrier is also equipped with an 18-volt headlight, a tail light, stoplight and horn.

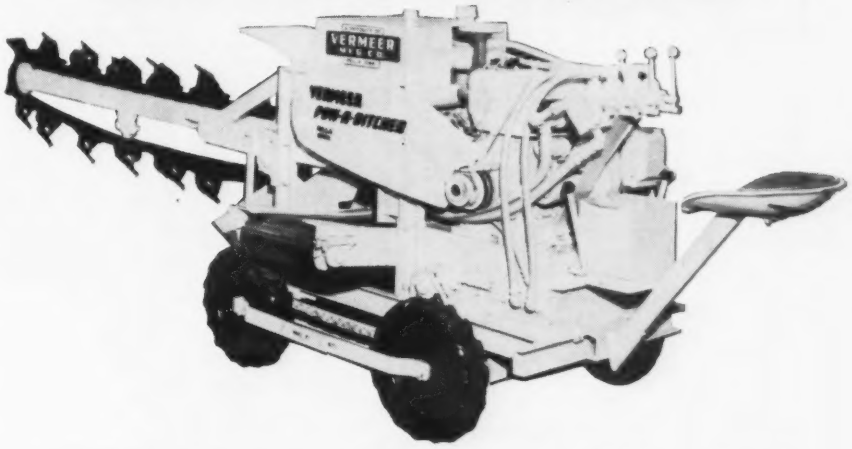
In size, the unit measures 47½-in. wide, 124½-in. long and 46½-in. over-all height. It has a turning radius of 6 ft., 10 in. and a ground clearance of 5-in. Its speed ranges up to 15 mph forward and 6 mph in reverse. *Check NP* 512.

Terminal Housing

RELIABLE Electric Company has

NOW... THE NEWEST, FASTEST

SMALL DITCHER ON THE MARKET



VERMEER'S NEW MODEL W-3

POW-R-DITCHER

Designed Especially For Gas and Electrical Service . . . and Shallow Water Lines

Looking for a rugged, fast, powerful **small ditcher** that will really work? Vermeer's small-but-mighty W-3 Pow-R-Ditcher will fill the bill . . . an ideal unit for contractors, municipalities, utilities and custom operators. The W-3 is available with rubber-tired wheels or crawler tracks and features a completely hydraulic drive system. No gear shifting. An adjustable rubber belt conveyor deposits dirt on either side of ditch. If you are looking for a faster, easy-to-operate multi-purpose small ditcher, mail the coupon. Demonstrations are being scheduled now in all sections of the country. We will be happy to demonstrate the W-3 for you at your convenience.

EQUIPPED WITH 18 H. P. ENGINE

- Digs 3″ to 12″ wide at 1′ to 10′ per minute — down to 4′ deep
- Equipped with transport speed
- Heavy chain, boom and frame
- Has separate hydraulic motor for each set of wheels
- Completely hydraulic drive
- Available with wheels or tracks

MAIL COUPON FOR COMPLETE ILLUSTRATED LITERATURE AND LOW PRICES

Please send complete information and low price of new W-3 Pow-R-Ditcher.

Name.....

Title or Dept.....

Address.....

City..... State.....

☐ Check here for FREE W-3 demonstration in your area.

VERMEER MANUFACTURING COMPANY

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Now available in production quantities!

HIMCO
fiberglass
SAFETY LADDERS

ELECTRICALLY NON-CONDUCTIVE

LIGHTWEIGHT (24' EXT. LADDER WEIGHS 43 LBS. COMPLETE)

FLAT TOP ALUMINUM RUNGS

NON-SLIP STEPPING SURFACE

SPLINTER PROOF

MOISTURE PROOF, CORROSION RESISTANT

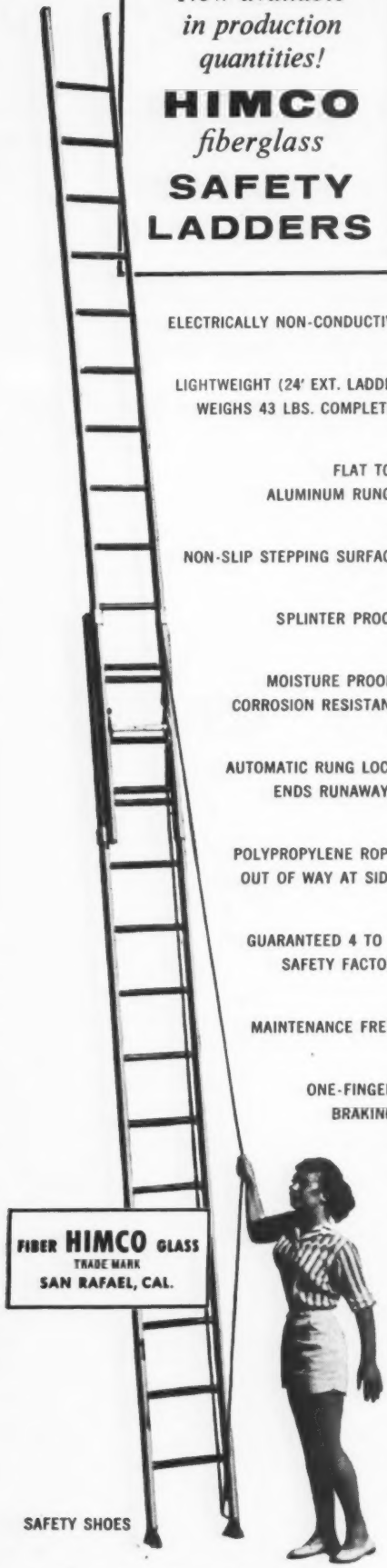
AUTOMATIC RUNG LOCK ENDS RUNAWAYS

POLYPROPYLENE ROPE OUT OF WAY AT SIDE

GUARANTEED 4 TO 1 SAFETY FACTOR

MAINTENANCE FREE

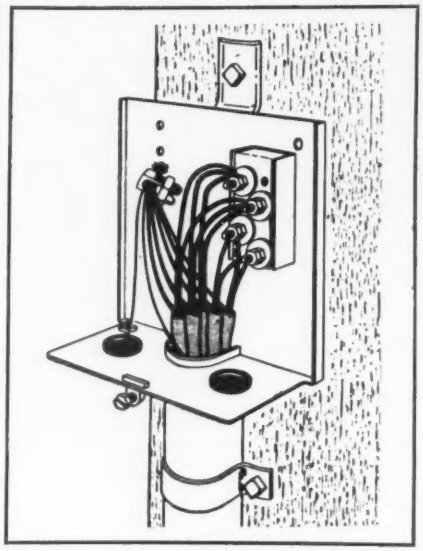
ONE-FINGER BRAKING



Write for prices and complete information to . . .
HIMCO
P. O. Box 54, San Rafael, Calif.

announced a new pole mounted buried wire and cable terminal housing.

Combinations of seven different wire terminal blocks and protectors



Showing cover off of terminal housing.

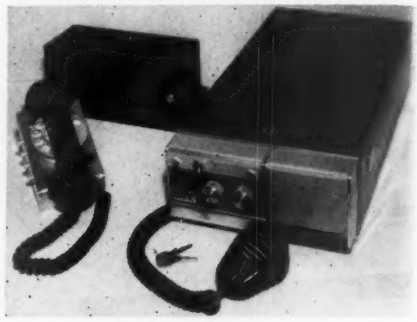
may be installed within the terminal. There is also room for loading coils should they be needed. The No. 650 terminal can be tailor-made for specific job at the job site.

The terminal housing is made of aluminum and the "U" guard is of galvanized steel. For highly corrosive areas, the No. 650 is available in a corrosion resistant model. *NP* 513.

Mobile Radio Telephone

A MOBILE radio telephone, the MT600, that fits any car and may be used as a two-way mobile radio, has been developed by the Industrial Products Division of International Telephone and Telegraph Corporation.

The unit can be used for either kind of operation by means of plug-in connections without modification of



the basic chassis. The Autocom may be used with future radio-telephone systems employing two-way dialing duplex operation and more than two RF channels.

When used as a mobile radio, it is compatible with all existing systems. *Check NP* 514.

Segment Bender

GREENLEE Tool Co. has announced the addition of their No. 777 lightweight segment bender for 1¼″ through 4″ aluminum or steel conduit and pipe. Weighing 65 lb., exclusive of shoes, it can be transported and operated by one man.

The design of this bender makes it possible, with a few optional parts, to do 90° one-shot bending ½″ through 2″, and thin-wall (EMT) bending ¾″ through 2″.

The bender is powered by a two-speed, 10,000 psi hand pump, and can also be operated with a power pump for even faster operation. The ram develops 27 tons of pressure, which gives power to spare for the toughest bending jobs and will even bend extra-heavy schedule 80 pipe. *Check NP* 515.

NEW PRODUCTS' DEPARTMENT **9-15-60**
Telephone Engineer Publishing Corporation
7720 North Sheridan Road, Chicago 26, Illinois **Date** .....
ATTN: Dick Reynolds

Please send me additional information concerning the following New Products.

NP 508..... NP 509..... NP 510..... NP 511.....
NP 512..... NP 513..... NP 514..... NP 515.....

NAME..... POSITION.....
COMPANY.....
ADDRESS.....
CITY..... ZONE..... STATE.....

I am a subscriber to TE&M. ☐ Yes ☐ No (check one)

"MEASURING FOR GROWTH"

(Continued from page 50)

of the four mile area, utilized at 12,000 units per square mile. This computation produces 960 multi-family units. We go on to compute 1,344 commercial units and 3,600 miscellaneous units.

Naturally, areas are different according to topography and types of premises. So no allowance has been made in Area No. 24 for manufacturing and industry because this is a "bedroom" area. We reach a grand total of 10,008 units in Area No. 24 and a total for the exchange and the company by merging all other areas with No. 24.

After we have determined the ultimate number of units, we measure with another yardstick to determine approximately what year we are likely to reach ultimate saturation. This is most significant. If we are going to reach ultimate saturation within the next ten years, we should be so considering it in our *present* plan making.

What Is The Station Growth?

THE CORRELATING yardstick is a continuation of our past rate of station growth adjusted for known future developments. Study of a period with normal growth, possibly the past three years, indicates to us that primary station growth rate is seven per cent per year, compounded. We check this against the population forecast estimates available when measured by one primary station per 3.0 persons.

Chart Two indicates that we have a decreasing ratio of population to primary services. You can see that in 10 years we have declined from 3.8 people per telephone to 3.3 and we expect a further decrease. Accordingly, we finally use a ratio of 3.0 instead of 3.3.

We adjust for probable increased saturation of premises, more primary telephones per hundred houses, and we adjust for more primary stations per premise to reflect that we expect to install two lines in some residences.

Chart Three gives us a comparison of ratio of total stations to primary stations and indicates that extensions are growing more rapidly than primaries. Looking at *Chart Three* you see that in 1951 there were nine extensions to every 100 primary stations (1.09 ratio) and by 1959 there were 28 extensions to every 100 primary stations (1.28 ratio). We expect a further increase.

CHART THREE
Ratio Total Stations to Primary Stations

Year	Total Stations	Primary Stations	Extensions	Ratio
1950	5,230	4,805	425	
1951	5,777	5,264	513	1.09
1952	6,281	5,690	591	1.10
1953	6,959	6,296	663	1.10
1954	7,701	6,931	770	1.11
1955	8,661	7,644	1,093	1.13
1956	9,573	8,283	1,290	1.15
1957	10,725	8,958	1,767	1.19
1958	11,524	9,378	2,146	1.22
1959	12,672	9,900	2,772	1.28

Ultimate Use Summary

COMBINING these data we have now decided that in this exchange the company is faced with a demand for 10 per cent per year increase in stations, including extensions, and an ultimate number of premises of more than 23,000. It appears that in this exchange the company will reach a saturation of better than 90 per cent telephone primary services to premises and can expect to provide 75 per cent one-party services to total services. The combined factors of gain, ultimate number of premises and service quality objectives may lead the company into consideration of a third unit of central office by 1966.

CHART TWO
Population To Primary Service

Year	Primary Service	Population	Ratio
1950	4,805	18,532	3.8568
1951	5,264	20,200	3.8373
1952	5,690	21,800	3.8312
1953	6,296	23,563	3.7425
1954	6,931	25,500	3.6791
1955	7,644	27,400	3.5845
1956	8,283	28,800	3.4770
1957	8,958	30,200	3.3712
1958	9,378	31,450	3.3535
1959	9,900	32,700	3.30

Ten-Year Growth Trend

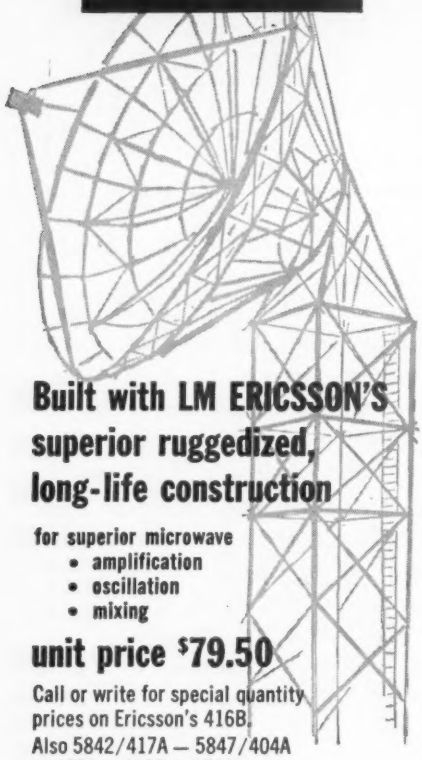
OUT OF the data developed for the ultimate use study we extract a forecast of growth trend for the next 10 years and develop a plan to handle this growth in every department of the company.

We can make a reasonable estimate of the number of primary stations, the number of extension stations and the quantity and type of backbone outside plant required to feed these stations. These outside plant estimates we develop for each year of the next 10 years. Since many trade articles have treated this subject, I shall not dwell upon it any further, but go into some simple techniques that have been used to forecast central office equipment requirements.

Basically, what we want to know about the central office is when we must add line equipment, when we must add connector normals and when we must add building space. Two simple charts will help us in determining line equipment and connector normal requirements.

Chart Four tells us in what years we shall probably have to add line equipment. This chart plots the monthly increase of line equipment in use and trends out over the years

DELIVERY FROM STOCK 416 B



Built with LM ERICSSON'S superior ruggedized, long-life construction

for superior microwave
- amplification
- oscillation
- mixing

unit price $79.50

Call or write for special quantity prices on Ericsson's 416B. Also 5842/417A — 5847/404A — 2C51 — 403B — 6761 — 7150 — 407A — 408A and other telephony tube types.

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that lie ahead. The solid line shows total line equipment in service and the dotted line indicates where line equipment additions will be necessary.

By reference to *Chart Four* you can see that in this exchange, line equipment will have to be added prior to January 1, 1961 because in April of 1961 the line representing line equipment in use will pass the plateau showing line equipment available.

How do we determine when we must add connector normal equipment? *Chart Five* helps us. The connector normals in use are plotted and extended to give us a trend while the connector normals available are shown with a solid line on *Chart Five*. After allowance for the intercept margin we can see where new connector normals must be added. *Chart Five* indicates requirement for more connector normals in February of 1961.

Five-Year Construction Forecast

NOW THAT we have the 10-year trend, we are ready to decide what construction must be done within the next five years and how much it will cost. We develop a five-year construction budget such as the one shown in *Chart Six*.

Reference to *Chart Six* discloses what is going to happen within the next five years. You will observe that there will be a land and building addition in 1964 at a cost of $150,000. You will also notice that cable and underground conduit additions will be extremely heavy for the first four years and then the fifth year will taper off to be very nominal.

From *Chart Six* we learn how much new construction money is going to be needed each year in the next five years. Reference to the bottom line of the chart indicates that the new money requirement for this exchange will be $262,000 the first year and will decline to as little as $54,000 in one of the later years.

When Do We Need More Money And What Kind?

THE FIVE-YEAR construction forecast gives us very important information regarding the company's future financing requirements. We now know how much money may be required by years for the next five years. On the basis of our own company policy, we can determine probable methods of raising the new money.

As disclosed on *Chart Seven*, in 1959 the company had a debt ratio of 43.2 per cent. Since the company is desirous of lowering the debt ratio, it can now be decided to issue more stock in 1960 and again in 1961, which will bring the debt ratio down to 38.1 per cent.

Assuming that the company is

Please turn to page 94

CHART SIX
Five-Year Construction Forecast
1960-1965

Description	1960	1961	1962	1963	1964	5-Yr. Total
(a)	(b)	(c)	(d)	(e)	(f)	
1. Land & Buildings	$	$	$	$	$150,000	$
2 Central Office Equipment	107,000	160,000	35,000	5,000	125,000	
3. Station Apparatus	43,800	50,000	50,000	50,000	50,000	
4. Station Connections	26,400	30,000	30,000	30,000	30,000	
5. Pole Lines	23,700	25,000	25,000	25,000	25,000	
6. Cable & Underground Conduit	162,000	172,000	188,000	182,000	25,000	
7. Aerial Wire	3,000	3,000	3,000	3,000	3,000	
8. Furniture & Fixtures	4,000	4,000	5,000	5,000	15,000	
9. Vehicles & Tools		4,000	4,000	4,000	4,000	
Gross Construction Budget	$369,900	$448,000	$340,000	$304,000	$427,000	
Less:						
Depreciation Accruals	166,900	200,000	210,000	220,000	230,000	
Transfer from Surplus		30,000	30,000	30,000	30,000	
Net Construction Budget (New Money)	$262,000	$218,000	$100,000	$ 54,000	$167,000	$801,000

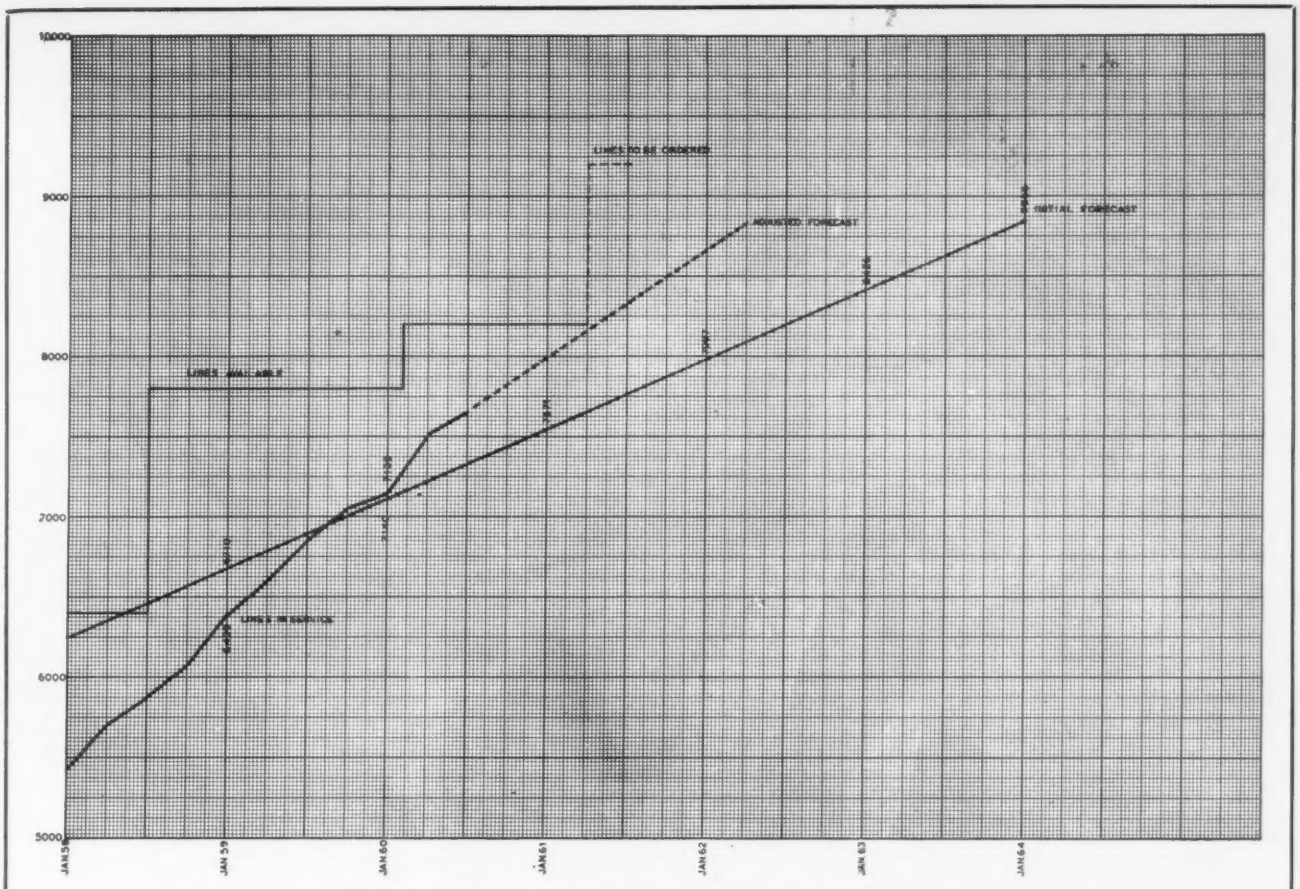


CHART FOUR: — Line equipment usage and forecast.

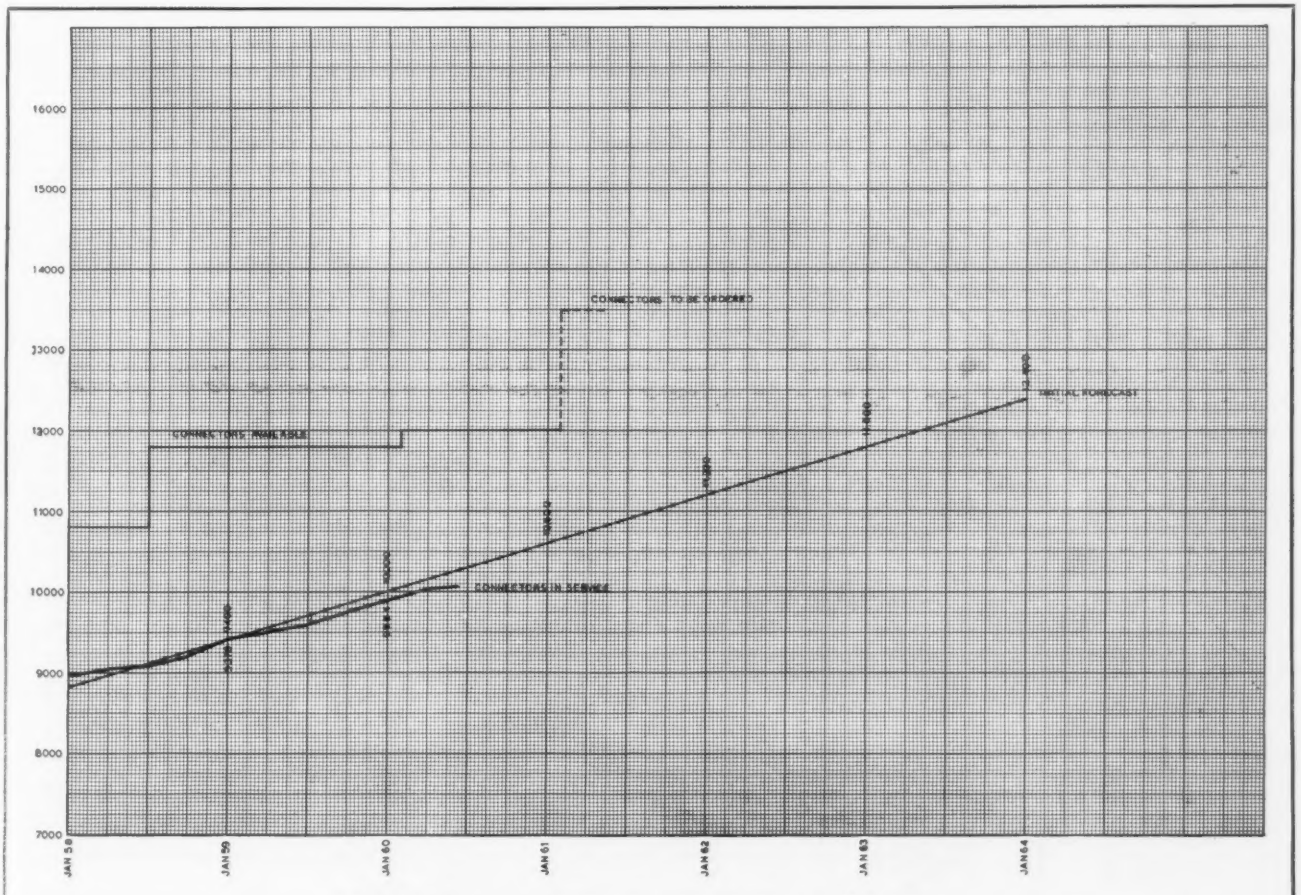
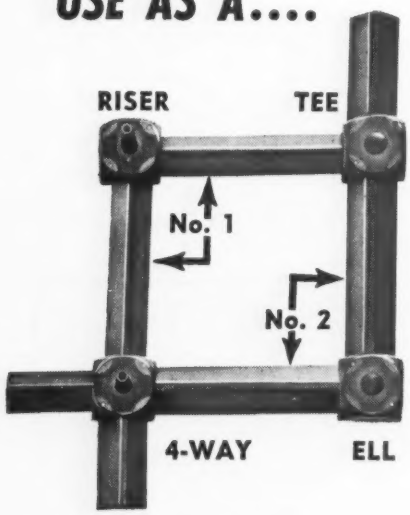


CHART FIVE: — Connector normal usage and forecast.

NEW, universal fitting* used with the two sizes of Flexiduct solves all over-the-floor wiring problems.

USE AS A....



- **Under Floor Input**
- **Terminal Box**
- **Junction Box**
- **Or In Combinations of All**

Fits any over-the-floor wire molding. This new fitting used with Flexiducts two sizes is the popular, easy solution on all jobs.

Flexiduct No. 1
will carry up to 8 conductors of inside wire. Chase ¼" x ½"

Flexiduct No. 2
will carry up to 25 pair cloth cable or 16 pair plastic. Chase ½" x ¾"

Always keep Flexiduct on hand.

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CHART SEVEN
Preliminary Forecast of New Money Requirements
1960-1964

	1959 Actual	PRELIMINARY FORECAST 1960	1961	1962	1963	1964
Common Stock	$1,600,000	$1,850,000	$2,100,000	$2,100,000	$2,100,000	$2,100,000
Preferred Stock	321,675	318,425	315,175	311,925	308,675	305,425
Surplus	444.775	475,000	505.000	535.000	565,000	595,000
Sub-Total	$2,366,450	$2,643,425	$2,920,175	$2,946,925	$2,973,675	$3,000,425
Long Term Debt	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	2,121,000
Total	$4,166,450	$4,443,425	$4,720,175	$4,746,925	$4,773,675	$5,121,425
Debt Ratio	43.2	40.5	38.1	37.9	37.7	41.4

Notes:
(1) Above assumes common stock issue of $250,000 in 1960 and $250,000 in 1961.
(2) Assumes bank borowings for 1962 @ $100,000 plus 1963 @ $54,000 plus 1964 @$167,000. Total — $321,000.
(3) Assumes long term debt increase $321,000 at end of 1964.

ready to incur additional long term debt when that ratio reaches 38 per cent, the 1962 new money requirement for construction could be covered by additional long term borrowings. However, reference to our five-year construction forecast in *Chart Six* indicates that in the year 1963 we need only $54,000 of new money, which would not be a large enough sum to handle via long term borrowing. Therefore, indications are that the company could utilize short term borrowing for one or more years until such time as it built up a large enough requirement to be handled by long term funding. *Chart Seven* assumes that additional long term debt would be acquired in the year 1964.

Hence, out of the five-year construction forecast and the new money requirements, we have determined that the company could issue stock in each of two years, and then after a lapse of two more years, incur additional long term debt. Thus, we have some good basic information for use in measuring for growth.

Twelve-Month Moving Budgets

WE HAVE so far accumulated some good ideas about the ultimate growth position of our company, the probable trend for the next ten years and the likely five-year construction requirement. Now, we must determine what is going to happen next year. It has been said that the most important step in any long journey is the first one. Likewise, a very important step for us in the journey to long term growth is the one to be taken in the next 12 months.

In my opinion any soundly operated company must know for the next 12 months what its construction of plant additions will be, what its net earnings and rate of return will be and whether the flow of cash into and out of the company will be adequate to handle the growth. We give ourselves this information by developing three budgets which are adjusted every three months. I call them 12-month moving budgets.

A plant construction budget is shown by quarters of the year and revised at the beginning of each quarter. This means that at any time the company knows what it expects to construct for the next four quarters or twelve months. This budget is most helpful in determining the flow of short term borrowings if used to finance construction.

The second moving budget shows income, expenses and net earnings for the company by quarters of the year. In addition to showing net earnings, it produces a rate of return. From this second moving budget we determine the trend of net earnings of the company, the trend of rate of return and the requirement for application to regulatory authority for rate increases or other steps required to keep net earnings at a healthy level.

The third 12-month moving budget relates to cash flow. It may include both funds to be spent for construction and for regular operation or be made up in two parts, one construction and one regular. *Chart Eight* il-

	January	February	March	April	May	June	July	August	September	October	November	December	Total 1960
Receipts:													
Estimated	$135,060	$135,300	$135,600	$135,900	$136,200	$136,500	$136,800	$137,100	$137,400	$137,700	$138,000	$138,300	$1,639,800
Disbursements													
Short Term Interest	1,400			2,700			4,100			1,400			9,600
Occidental Life	38,600						38,600						77,200
Fed. Income Tax			81,200			81,200			16,500			16,500	195,400
State Fr. Tax			9,700						9,700				19,400
Property Tax				37,600								142,300	179,900
Dividends													
Common		45,000			30,000			30,000			34,000		139,000
Preferred		4,300			4,300			4,300			4,300		17,200
Wages													
Estimated	30,000	28,000	28,000	36,000	28,900	28,900	36,300	29,000	30,100	35,500	28,200	35,300	374,200
Routine Expenditures													
Estimated	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000
Total Disbursed	$120,000	$127,300	$168,900	$126,300	$113,200	$160,100	$129,000	$113,300	$106,300	$ 86,900	$116,500	$244,100	$1,611,900
Balance 12-31-59	152,200												152,200
Preliminary Balance	167,200	175,200	141,900	151,500	174,500	150,900	158,700	182,500	213,600	264,400	285,900	180,100	180,100
Transfer to Const.	41,000												
Net Balance	$126,200	$134,200	$100,900	$110,500	$133,500	$109,900	$117,700	$141,500	$172,600	$223,400	$244,900	$139,100	$ 146,200

CHART EIGHT: — Cash forecast, regular account, 1960.

lustrates a regular operating account cash flow 12-month moving budget. This budget is adjusted by quarters but is also shown by individual months.

Reference to *Chart Eight* will show that allowance is made for each major item of expenditure. For example, short term interest is shown during the months of January, April, July and October. Federal income tax payments are shown in March, June, September and December. The bottom line develops the probable average cash balance in this account at the end of each month so that we know that the company will have available the funds necessary to pay the income taxes when due. (Uncle Sam doesn't wait for his money.)

What we have given here is a sample of some of the guideposts to be used in measuring growth so that one sleeve of the coat does not wind up shorter than the other or that the pants fit fine except that they won't reach below the knees.

Helpful tools in measuring for growth are an ultimate land use study, a ten-year growth trend, a five-year construction forecast and twelve-month moving budgets. I hope you can use them. — *Allan R. Stacey.*

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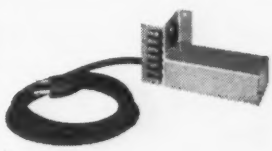
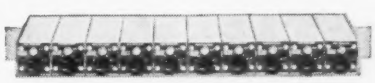
The 455A Amplifier is a transistorized repeater type amplifier wrapping up a compact package of gain for telephone circuit use. Incorporates the gain, power handling capacity, frequency response, plug-in features in the physical size of vacuum tube type repeater. Ten repeaters go in the same standard rack mount used for vacuum tube types. Operates on 48 volt DC @ 22 ma: (453A model operates on 24 volt DC). Since it is transistorized no 130 volt supply is needed. For details, write for Altec Lansing Bulletin #13385.

The 533 Power Supply is designed to fit within a 105-B Apparatus Box. The power supply bracket includes the required socket and space to mount a single ALTEC transistorized repeater type 449, 450 or 453-A and, at reduced power, the 447-A. Operating from 117 volts AC the unit delivers 20 v at 25 ma. Write for Bulletin #13132.





The 12910 panel is provided to mount 10 amplifiers or Altec line Equalizers. The panel is 1¾" in height.

For complete information about Altec telephone and paging equipment, write to the address below or call 714-PRospect 4-2900 in Anaheim.

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"LINE CONCENTRATORS"

(Continued from page 53)

Almost overnight, the entire situation changed. Several new industries were formed in cities within a short driving range of the lake and, of course, the boating craze also swept through the area. Simultaneously with these events, new homes began springing up around the lake in an accelerated fashion. The great majority of these homes were not of the "summer home" type but were permanent, year-around homes housing people who were not only candidates for telephone service but *demanded* it and *right now*.

A quick survey by the Bremen Telephone Co. indicated that at least 110 stations required or requested service immediately and, at the rate of growth, prospects were good to double this number within five years. A 26-pr. exchange cable had been extended into the general area of the lake, some years before, but four pair of the twenty-six were used to serve rural lines and were not available in the lake area.

In addition, a volunteer fire department had been organized in the lake area and requested one cable pair connected to the Bremen Fire Department for use as a common fire-notification system. This meant that only 21 pairs were available for distribution around the lake. It was obvious that additional relief was necessary; however, the cost of cable rearrangement, spinning and splicing, etc., for a 26-pair addition was estimated to be between $15,000 and $20,000.

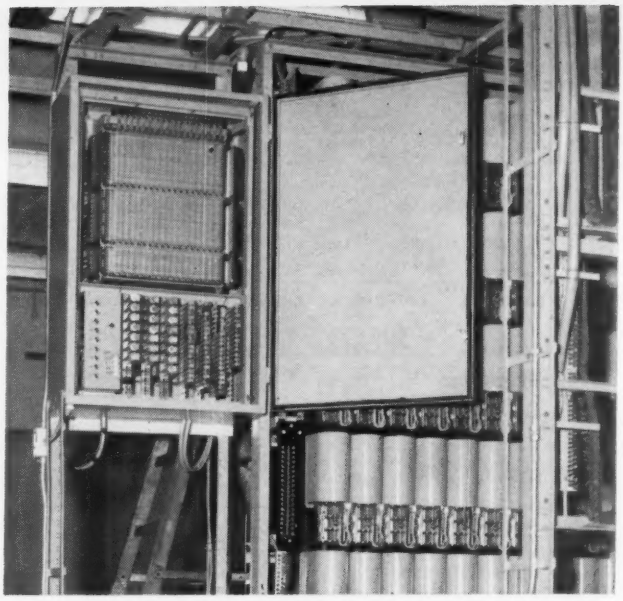

FIG. FIVE: — A typical rack installation of the central office unit of a line concentrator in a step-by-step office. The dust-tight door has been swung open.

Decision For Line Concentrator

INSTEAD of a cable addition, a Leich 49-9-2AZ line concentrator was installed at an initial cost of approximately $4,300.00 for the equipment, including a

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weatherproof housing for the distant unit at the lake site. A view of this pole-mounted unit can be seen in *Figure Two*. It was mounted approximately 2 ft. above the ground on a pole set for the purpose and close to the cable terminal pole. *Figure Three* is a closer view of the unit with the cabinet opened. Trunk selector switches are at the top left, associated relays are to the top right, and protection for the "in" and "out" distribution wiring can be seen at the bottom of the cabinet.

In *Figure Four*, James Koontz, manager of the Breman Telephone Co., can be seen making a test call over the unit through a test telephone which is left in the unit permanently. To date, a total of 19 lines, serving 132 stations, has been assigned to the concentrator unit.

On the remaining 11 cable pairs, (11 pair required for the concentrator unit) one pair is used for the firemen's notification system previously mentioned, five pair are used for multi-party residence lines, one pair is used for a one-party business, and four pair are vacant.

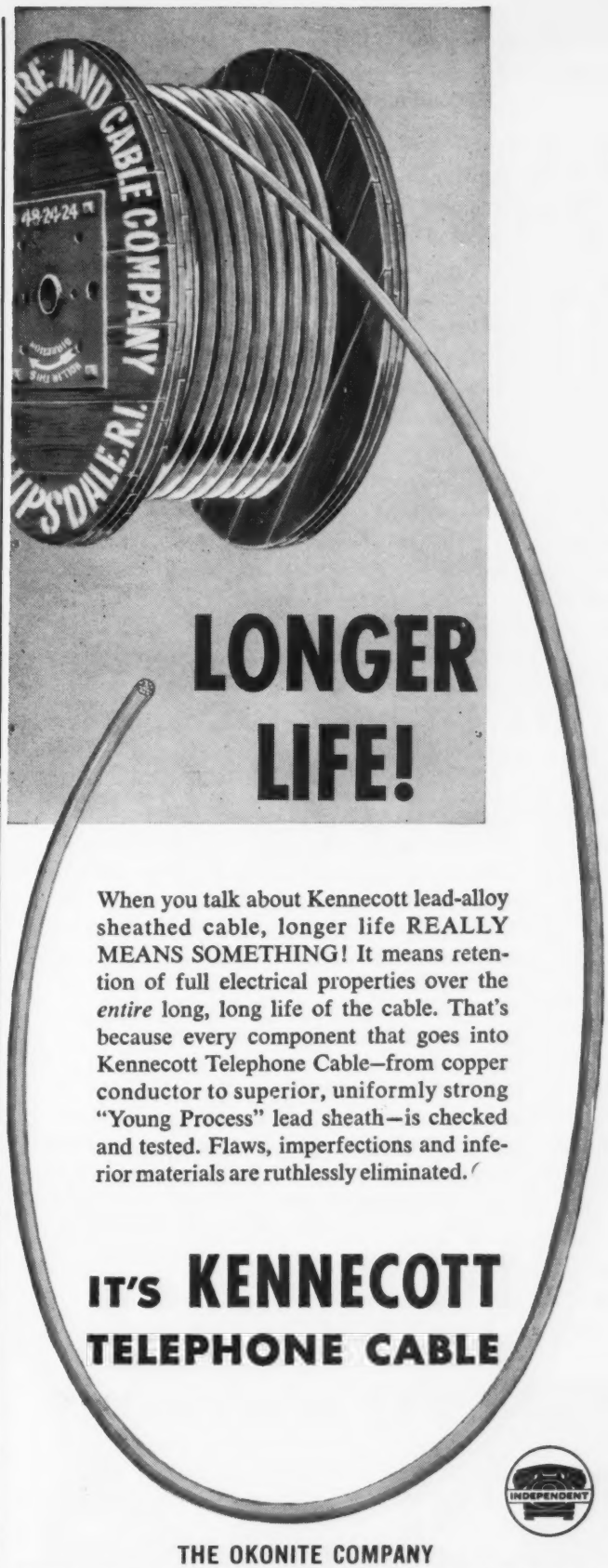
It is planned to further rearrange the unit, from the standpoint of redistribution, and to more fully utilize the total of 49 lines available in the concentrator itself. A zoned rate is available in the lake area and it is expected that requests for upgrading of service will become more prevalent in the very near future and that more one, two, and four-party line service will be added.

It is obvious that here is a case where the investment required has been cut to approximately one-third, or less, of that required if plant expansion had been accomplished by other methods. The people at Bremen informed me, during the course of my visit, that they may soon change out the unit to the 49-18-3AZ unit (49 lines, 18 trunks, 3 control pairs), which would then free the smaller 49-9-2AZ for some other "hot spot" in the exchange area. The larger unit, with its heavier trunking, will allow them even greater flexibility in establishing new lines which have high local community interest in the lakeside area.

It would appear that there is a great application for line concentrators. Overnight suburbs, new shopping centers, concentrated motel or hotel sites, distant "crossroads" communities — all of the locations that seem to be appearing without our knowledge may be candidates suitable for line concentrator applications. An 11-pair cable can be quickly made the equivalent of 49 lines — a 26-pair cable, the equivalent of 64 lines — a 51-pair cable the equivalent of 127 lines, or 107 lines if heavier trunking is needed.

The list is almost endless and the possibilities unlimited, but, one thing is certain, no plant engineer can afford to overlook the possibilities of line concentrator application from the standpoint of dollar economies and from the standpoint of ready availability of topnotch telephone service. — *C. D. Ehinger.*

Any comments, criticisms, or suggestions for future topics? Address all correspondence to "Sub-Harmonics and Overtones," Telephone Engineer and Management, 7720 Sheridan Road, Chicago 26, Ill.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"The Pre-Wiring Program"

(Continued from page 55)

side wiring cable may be installed to provide additional circuits needed for the type of telephone service.)

This arrangement is considered more satisfactory and more economical of labor and material than having the station wiring installed to every outlet box in expectation of telephones being connected at every such location (*Figure One*). Thus, only the outlets actually being used for the telephone connections are fished at the time the service is installed.

Telephone outlets should be on the same level with electric convenience outlets in the same room, and not closer together than one foot. The outlets should not be installed near windows, doors, and fireplaces, or near places where water may come in contact such as bath tubs or kitchen sinks. The contractor should cover all outlets with blank plates (*Figure Two*) which may be later changed to a cord hole or jack type for the telephone instrument. The cord hole type cover plate is also illustrated in *Figure Two.*

For a wall telephone, the outlet box is mounted at a standard height (56 inches). The outlet should not be placed too close to a door or window trim or in a location where the wall telephone would interfere with cabinet or oven doors.

It is important for the builder to properly route the fish wires to avoid damaging the insulation of the station wires when these are pulled in later on. The wires should be run vertically and not passed horizontally through studs and joists.

Short sections of curved ½-inch conduit should be securely fastened in place at bends to pass the wires smoothly in the pulling-in operation. Where the station wire will pass through narrow and rough spaces, short sections of ½-inch conduit should be placed to protect the wire from abrasion.

The .045 inch stainless steel wire used for lashing telephone cable makes a good pull wire. These wires should be secured in the outlet boxes so they will not be accidently pulled out and lost.

A good common location for terminating the pull wires would be in the house basement, attic, utility room, or built-in garage. At this point, each pull wire should be tagged to indicate the outlet box where it terminates. If the station protector is mounted on a finished wall, the contractor should place a pull wire to pull in the ground wire to the ground connection, which is generally a cold water pipe, at the nearest accessible point. In this connection, it is desirable to place an outside type protector whenever practicable to avoid mounting the protector on a finished inside wall.

At the time the station wires are pulled in, each wire is tagged at the common point to indicate the location of the particular telephone. A plastic tube or wire guard is placed over the end of the wire in the outlet box and

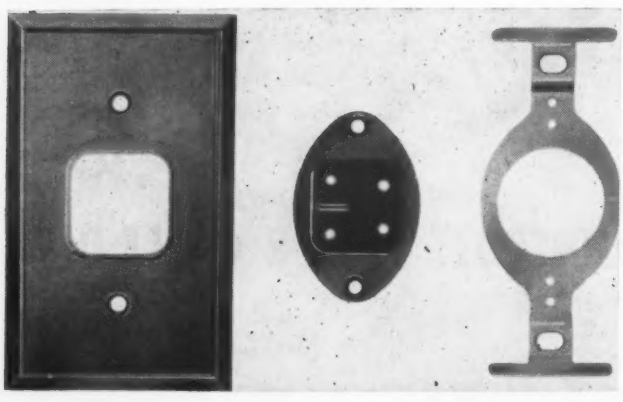

FIG. FOUR: — Rectangular cover plate with oval flush type jack and mounting adapter for outlet box.

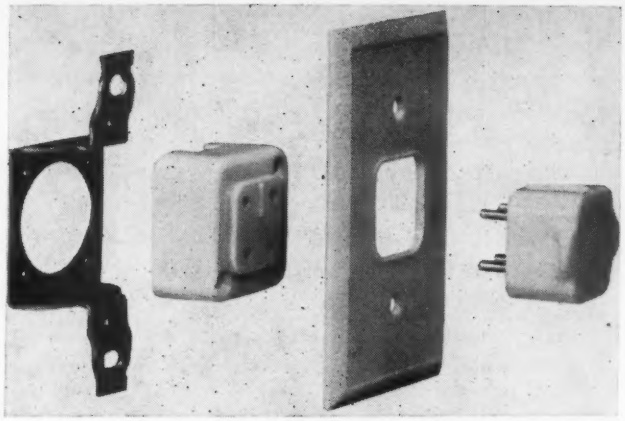

FIG. FIVE: — Exploded view of plug and jack assembly with mounting adapter, non-flush type jack, rectangular cover plate, and four-conductor plug.

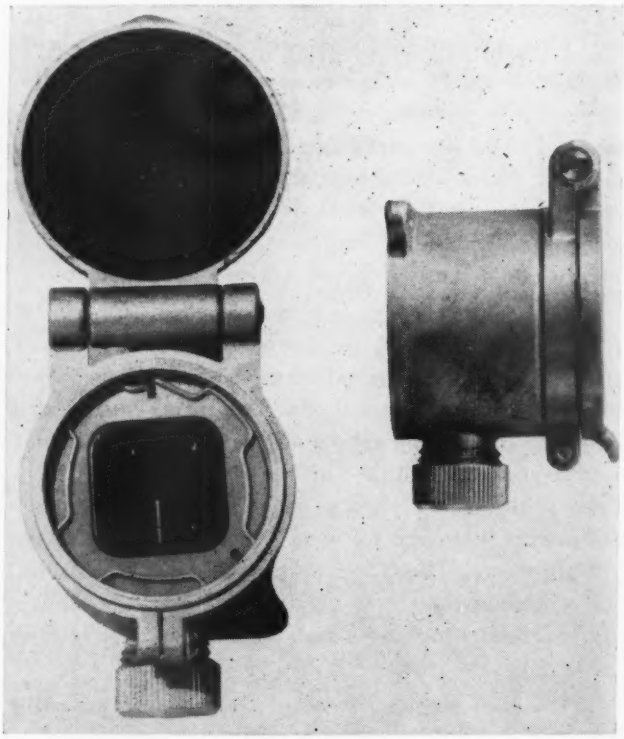

FIG. SIX:—Outdoor weatherproof jack assembly. The non-rusting waterproof aluminum receptacle houses an oval flush type jack. This unit is designed to meet a growing demand for outdoor jacks for portable telephone on patios or in backyards.

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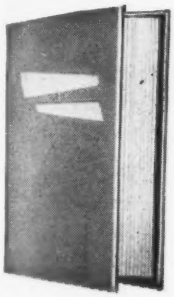

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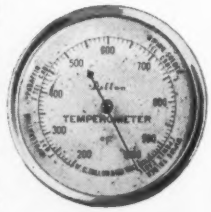

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the clamp in the box is tightened down on the encased wire to hold it in place.

A six-pair connection block may be employed for terminating the station wires at the common location, or several standard connecting blocks may be assembled in a row.

Jack and Plug Installations

WHEN THE customer orders jack and plug service for a portable telephone, all outlets may be equipped with station jacks. This arrangement enables the subscriber to use portable telephones at less cost than having extension telephones at various locations throughout the dwelling. Various types of telephone plugs and jacks are illustrated in *Figures Three to Seven.*

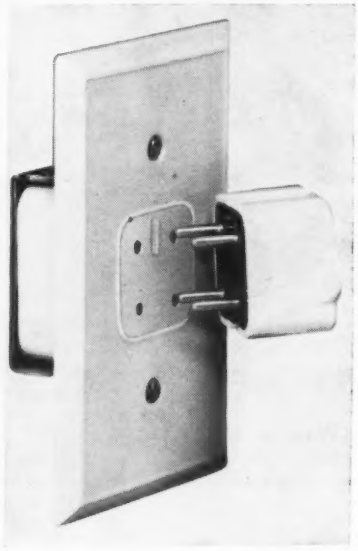


FIG. SEVEN: — Plug and jack assembly with four-conductor plug for interior use.

A separate ringer box will usually be required, to make sure the subscriber can be signaled at any time, unless a main telephone is provided permanently connected at a location where the bell will be certain to be heard. A compact type ringer box may be used, mounted on a backboard attached to an outlet box in a central location.

Since contacts with architects, contractors, and builders are important to obtain adequate telephone wiring systems in buildings, telephone companies should strive to maintain such contacts in various ways. One method is the home planning service group described in this article. Advertising in newspapers is a good technique.

Placing of the popular "Telephone Planned Home" seals on windows of prewired dwellings where they will be seen by prospective purchasers helps the company promote the prewiring idea. Architects and builders appreciate getting information on planning wiring systems. The A.T.&T. Company provides a booklet that describes various wiring systems for buildings, principally office and apartment structures. The Suttle Equipment Corporation issues a brochure that lists materials available for prewiring homes and explains their use. — *Dick Reynolds.*

Officers and directors of the Missouri Telephone Association: (front row, l to r) 1st Vice Pres. R. E. WILLIAMS, Oregon; H. SCOTT GAULT, La Plata; Pres. JACK E. BARTRUFF, St. James; Asst. Sec.-Treas. KATHARINE A. BAUER, Jefferson City; 3rd Vice Pres. ELIZABETH JOURNEY, Higginsville; C. W. CHASTAIN, Princeton; (back row, l to r) Sec.-Treas. R. W. HEDRICK, JR., Jefferson City; FOSTER B. McHENRY, Jefferson City; J. G. KREAMER, Kansas City; P. A. BROWNE, Clarence; JOHN GAULT, Buffalo; CLIFFORD DAVIS, Sullivan.

Missouri and Kansas Telephone Associations Hold 9th Annual Joint Convention

THE DAY will come "before very long" when "toll facilities will be used as much for data transmission as for conversation, and probably even more," President Don B. Mitchell of the General Telephone & Electronics Corp. forecast to members of the Independent Telephone Pioneer Association meeting in conjunction with the 9th annual joint convention of the Missouri and Kansas Telephone Associations at the Town House Hotel, Kansas City, Kansas.

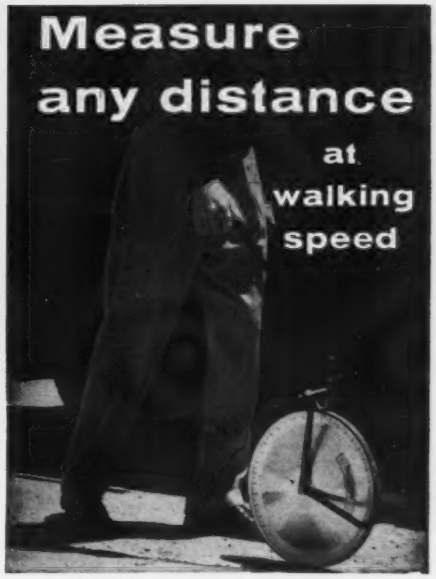
Looking into the future of the telephone business, from data transmission and slow-scan video to space communications, Mitchell commented that "today we look upon communications as the ability to get the right information to the right place at the right time. This job . . . involves a more complicated technology and a wider range of techniques than any other major industry."

One of the basic differences between the telephone field and manufacturing, Mitchell, who has spent much of his industry career in the latter field, commented, is that a manufacturer periodically may shut down his plant and "start again from scratch with new dies and new machines."

"But," he commented, "the job confronting the telephone business has been to meet the demands for more telephone service by superimposing new needs on existing needs, new plant on existing plant, and making them work together without any disruption of service.

"Some day, and that day is not as far off as you might think, a telephone company will be able to send practically any kind of information to anyone in any place, provided he has telephone service — and that will mean not only conversation but it will also mean images, whether they might be a photograph or a drawing, and that wide range of information that comes under that handy little name of 'data' — a financial summary, an engineering analysis, an inventory report. . ."

Basically, he pointed out, the need for data processing stems from the fact that too many businessmen "are spending entirely too much time reporting what happened yesterday or the day before yesterday, and not spending anywhere near enough time concentrating on what they are doing today and planning what they should do tomorrow." In addition, the emphasis on speed is becoming greater, he continued, and that businessman



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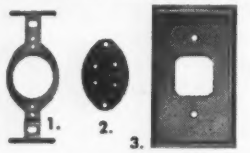
SE-63A Junction Box, 45c | SE-60 Mounting Ring* | SE-493A Oval Jack $1.30 | SE-16B Face Plate*

*SE-60 and SE-16B, 45c

Modern Plug and Jack Assembly

Latest telephone practice calls for use of the SE-63A (open) junction box, SE-60 mounting ring with oval SE-493A jack, and one of several types of the SE-16 series face plates. The SE-63A junction box screws into vertical wall studs (2"x4" or other) and accepts the hardware assembly as above.



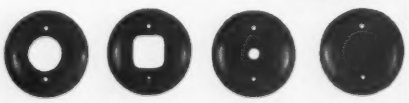
1. SE-43A Bracket 30c ea.
2. SE-493A Oval Jack $1.30 ea.
3. SE-19B Plate 28c ea.

Modern flush outlet installation utilizing SE-19B standard face plate, SE-493A oval jack, and SE-43A bracket holed for standard conduit box.

Face Plates

45c each, including SE-60 mounting ring and screws.

SE-19B



SE-16A | SE-16B | SE-16C | SE-16D

Five styles of face plates are available. SE-16A takes SE-47C multiservice, 12-terminal connecting block; SE-16B takes SE-493A jack; SE-16C for permanent phone; SE-16D for undecided service; SE-19B accepts SE-493A with SE43A bracket, or, SE-404B jack with SE-44 bracket for flush mounting.

In brown, ivory, or blue beige. Write Suttle or your local distributor for installation instructions and prices on the above piece parts.

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must have full information "in time to do something about it." There, he added, "we have one of the great opportunities for the telephone business — the communications business — helping the businessman to do a faster and a more effective job."

Mr. Mitchell described slow-scan video — "the use of telephone facilities within a given community to transmit and receive images" — as having "an extremely large potential." The big advantage, he pointed out, is that "the sender and receiver both have copies and can talk about it."

Turning to space communications, he said that "a reasonably reliable (space relay and satellite) system could well be a reality by 1970 — and it could even be sooner than that."

Ben Smith, general merchandising manager of the Southwestern Bell Telephone Co., told the convention a profitable sales program should be built around selling service that will be retained, service that does not have high "move" costs, and items that have high salvage value.

Profitable selling, Smith emphasized, is "determined by how well you mesh 'what' you sell with 'where,' 'when,' 'how,' 'why,' and 'to whom' you sell." He added, "Welding all these factors in your sales plans is marketing."

Telephone companies, Smith explained, have potential profits waiting for them in the residence and farm markets through additional sales of extension telephones, second main lines, and special equipment items such as illuminated dials.

"Less than 1% of the average annual household expense now goes for communications, indicating customers can afford more telephone service," Smith observed.

Mobility of the American people, with 156,000,000 recorded household moves in one five-year period, means that there is a constant residence telephone market, and one with excellent possibilities for contacts with customers, Smith stated. Household size is a major factor, he said, with Department of Commerce figures showing that 38 percent of all households have three bedrooms or more.

Additional residence service is profitable for the telephone company, he stressed, estimating that the average life of a residence extension in Southwestern Bell is 8¼ years. In addition, it takes less inward movement to make gains with residence extensions, he went on. Southwestern Bell has concluded that it must install 10 residence main stations, 5.8 business main telephones, or 4.1 business extensions to gain one telephone, yet it requires only 2.2 residence extensions to gain one station.

Turning to the farm market, Smith

Officers and directors of the Kansas Telephone Association: (standing, l to r) HUBERT FROMAN, Edna; W. E. GAULT, Gardner; GEORGE A. HEARNE, Kansas City; H. K. CULBERTSON, Sterling; (seated, l to r) JOHN HOPKINS, Topeka; DOUGLAS GLEASON, Ottawa; D. W. WRIGHT, Hutchinson; CARROLL NELSON, Lenora; (not pictured) Tom Fegan, Junction City; Dave McKay, La Crosse; Harry Miller, Great Bend; George Rooney, Belleville, Clifford Heidebrecht, Burrton; Justice E. Hoy, Topeka.

pointed out that while present farm telephone usage is relatively low, farmers' calls are frequently urgent. Surveys have shown that a substantial number of farmers are interested in telephones in farm buildings other than the house, to facilitate their receiving calls while working, or in such equipment as signalling devices, loudspeakers, and loudspeaker-microwave systems.

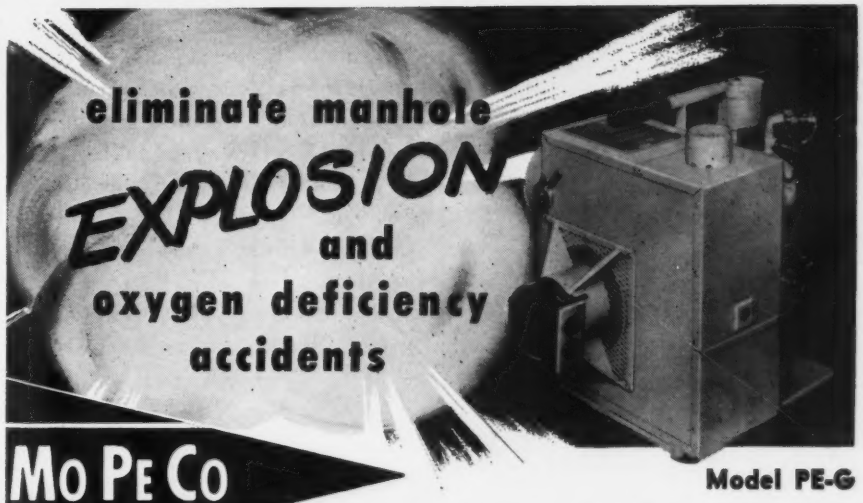
Other speakers were Foster B. McHenry, president of the U. S. Independent Telephone Association and president of the Capital City Telephone Co., Jefferson City, Mo., Dr. Graham Clark, president of the school of the Ozarks, and Rev. Roger L. Frederickson, Sioux Falls, S. D.

Jack E. Bartruff, St. James, was elected president of the Missouri Telephone Association. Other officers are: 1st Vice President, R. E. Williams, Oregon; 2nd Vice President, O. C. Agne, Wentzville; 3rd Vice President, Miss Elizabeth Journey, Higginsville; 4th Vice President, J. C. Torbett, Wright City; Secretary-Treasurer, R. W. Hedrick, Jr., Jefferson City; and Assistant Secretary-Treasurer, Katharine A. Bauer, Jefferson City.

Members of the board of directors are: John Gault, Buffalo; C. W. Chastain, Princeton; J. L. Van Horn, Grinnell, Ia.; Fred B. Hunt, St. Louis; Clifford T. Davis, Sullivan; J. G. Kreamer, Kansas City; Harold C. Stouffer, Diamond; Foster B. McHenry, Jefferson City; E. J. Ernest, St. Louis; P. A. Browne, Clarence; J. M. Roberts, Gallatin; W. R. Trowbridge, Springfield; and H. Scott Gault, La Plata, ex officio member.

Newly-elected officers of the Kansas Telephone Association are: President, Douglas W. Wright, Hutchinson; Vice-President, Carroll Nelson, Lenora; Secretary, Douglas Gleason, Topeka; and Treasurer, John S. Hopkins, Topeka.

Members of the board of directors are: Hubert Froman, Edna; George Rooney, Belleville; Douglas W. Wright, Hutchinson; Carroll Nelson, Lenora; George A. Hearne, Kansas City, Mo.; Justin E. Hoy, Topeka; Harry A. Miller, Great Bend; W. E. Gault, Gardner; Howard Culbertson,



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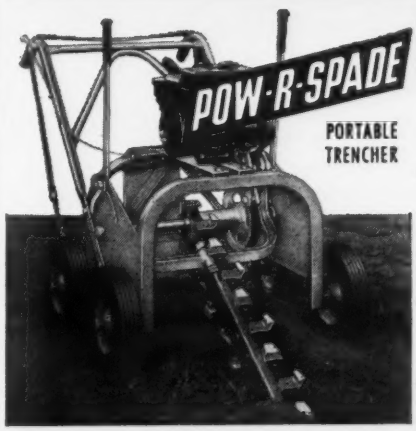

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Sterling; Clifford Heidebrecht, Burrton; Thomas B. Fegan, Junction City; and David J. McKay, LaCrosse.

At the annual business meeting of Theodore Gary Chapter, ITPA, Harold C. Stouffer, Diamond, was elected president.

Other officers elected are: Vice President, Jack E. Bartruff, St. James; Secretary-Treasurer, Katharine A. Bauer, Jefferson City; Directors — George K. Fitzgerald, Jefferson City; Verne Hix, Kansas City; Kathryn Journey, Higginsville; Wright King, Shelbina, and Berney Simner, St. Louis.

The Chapter by-laws were amended to permit the acceptance into Chapter membership of eligible applicants from the State of Kansas. Present national members residing in Kansas are now acceptable by transfer, and all future eligible applicants residing in Kansas may become members by making regular application for membership.

Pennsylvania Holds 58th Annual Meeting: W. M. Gottschall Elected President

THE Pennsylvania Independent Telephone Association climaxed its highly successful 58th annual convention at Bedford Springs Hotel, Bedford Springs, Pa., with an address by Cameron Hawley, noted author and lecturer. Hawley's speech, "The Quality of Leadership," was an appeal for a return to "Individuality" in the American way of life.

An outspoken opponent of "Conformity," Hawley, whose *Executive Suite* and *Cash McCall* novels were best sellers and later made into motion pictures, took several jibes at the "nice guy" complex that has invaded our social, political and economic structure.

He said Americans all too frequently liken the Individualist — the dissenter — to a dictator. But he cautioned: "Beware of the Dictatorship of Conformity. There is no freedom in a society where people live in the strait jacket of conformity."

He pointed out that this "Age of Conformity" has brought with it a gigantic bureaucracy in government and business. Pointing to America's declining world market he said: "Labor is not pricing us out of the market, but overhead is . . ." He cited European business as an example and said that more than one half of the salaried jobs in the U. S. didn't even exist in 1945. "We can't go on having 10 men to do the thinking of one man," he concluded.

In an earlier talk, Major General James Dreyfus, Director of Communications-Electronics of the Joint Staff, Department of Defense, told the delegates of the vast defense communications system and its world-wide distribution and problems. Major General Dreyfus said: "The defense system today employs every mode of electrical and electronic systems. The equipment must be designed with a world-wide system in mind."

While citing a few of the major problems confronting the defense department because of the great variances in communication practices throughout the Western and Allied world General Dreyfus said that a lack of experienced personnel in the Far East and Europe was one of the biggest problems.

"I think the American has the least patience with poor communications of anybody in the world, and you people have made this so with the type of service the American has learned to expect," General Dreyfus said. "Our Military Commanders are no exception and thus they give us communicators a hard time when service is substandard . . . Though you may not always think so, we do appreciate what we get from you. No senior military communicator, or senior officer of any type, who must spend as we do a certain portion of our service overseas, can help but note the striking contrast between nonmilitary communications service

overseas as compared to the U. S. standard . . ."

Frank G. LaPrade, second vice president of the U. S. Independent Telephone Association, and president of the Lee Telephone Co., Martinsville, Va., told the convention the Independent telephone industry is telling the world, through national magazine advertising and local newspaper publicity, that the Independent branch of the industry is an important part of the world's communication system.

"The United States Independent Telephone Association," he said, "represents the interest and is the voice of some 3,600 operating companies and about 150 manufacturing and supplier companies. Our operating companies have a plant investment of more than $3½ billion, annual gross revenues of $881 million, and now serve 11 million telephones in more than half of the total service area of the country. Because we know that without our facilities the country's network would not be complete and because of our many contributions to telephony, we are proud of our achievements and feel that we warrant consideration when matters affecting the entire industry are under consideration in our state and national capitals."

Discussing activities of the USITA Advertising Committee and the association's current advertising program, LaPrade stated, "We feel that the Advertising Program has paid off handsomely and evidence of this fact comes into the Washington office daily, much of it consisting of requests from people in all walks of life for further information about Independent telephone companies and their activities."

"Much of the mail," he said, "comes from investment brokers and other financial people who are interested in investing in Independent telephone securities. In connection with our printed advertisements, we have several valuable adjuncts, one of them being a financial mailing list. Periodically, we send out appropriate mailings to 3,600 financial people consisting of bankers, investment brok-

Next page, please

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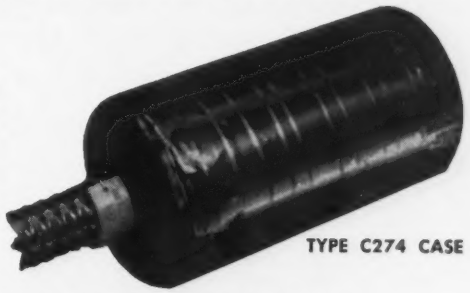
GALVANIZED STEEL CASE ASSEMBLIES

FOR DIRECT EARTH BURIAL INSTALLATION.
CONTAINING FOUR TO FOUR HUNDRED SIXTY COILS.

NOTE:
Galvanized steel cases and stub assemblies are completely covered with plastic tape to protect metal from electrolysis or other soil corrosive agents.



TYPE C274 CASE

- ***LEAD STUB ASSEMBLIES*** **ARE ARMOURED AND PRESSURIZED, AND**
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These assemblies are equipped with voice frequency coils, Types C632 (88 MH) and C638 (44 MH) coils are for subscriber loading, and Types C642 (88 MH) and C641 (44 MH) coils are for use on quadded inter-office and toll cables. Special coils can be made to meet other requirements.

Write us for assistance on your loading problems.

CEECO loading coils are sold by your telephone equipment supplier.

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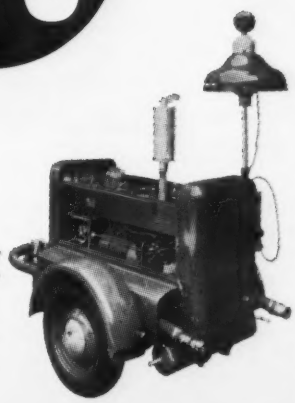

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S & G developed this amazing, versatile Power and Pumping Unit — now used extensively by telephone companies throughout the land. Its features include:

Generator (slow speed for *quietness*) — 2500 Watt, 110 Volt DC

Pump — 2800 GPH Diaphragm to remove seepage from drain back, can be operated from manhole by push button control

Air Compressor — to put cables under dry air pressure, operate air tools, for repairs and flash testing . . . plus 300-Watt floodlight to illuminate working area — buzzer signal for summoning helper — operates soldering pot, iron, electric and air tools — light, easy to handle.

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OSTS: AS LITTLE AS 2¢ PER FOOT!

BILITY: JOB PROVEN!

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See a demonstration!

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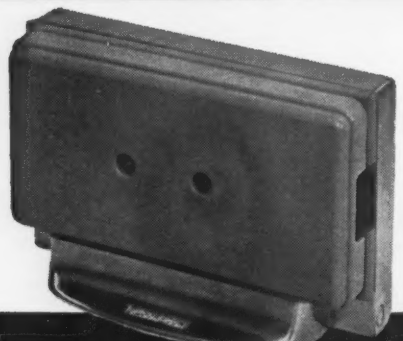
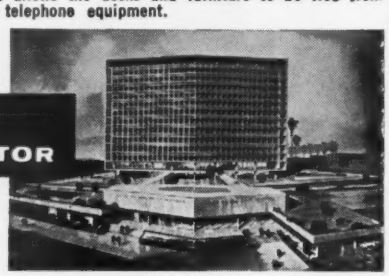


FLOOR-CON

. . . outmodes all other methods of telephone installation

Model No. 104 — shown with standard telephone equipment — accommodates up to 8 No. 44-A Western Electric connecting blocks (4 on each side). Model No. 102 takes up to 6 (3 on each side), or if desired, the back of the Floor-Con can be used for external ringers, buzzers, or auxiliary equipment. This allows the desks and furniture to be free from all telephone equipment.

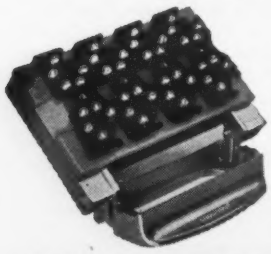


TELEPHONE FLOOR CONNECTOR

BEAUTY — clean lines and modern design

UNIFORMITY — provides standardized connections throughout

ECONOMY — phones can be completely installed prior to building occupancy



The fabulous FLOOR-CON allows phones to be connected entirely independent of office furnishings. Furniture may be moved or replaced without incurring expensive telephone changes. Gone are the clutter of equipment from desks and walls, and the needless marring of furniture.

Approved and specified by telephone companies, FLOOR-CON is used exclusively in many large buildings in business, industry and government. Attaches to all types of underfloor ducts and floor boxes, or fastens directly to the floor. Comes in four plated finishes to match the decor of the office.

FLOOR-CON — simplifies telephone connection service.

PAT. NO. 2854166

For catalog information and prices, write —

FLOOR-CON 759-761 NORTH SPRING STREET • LOS ANGELES 12, CALIF. Telephone: MAdison 4-5400

ers, securities analysts, and financial editors."

Reporting that the USITA Advertising Committee currently is engaged in plans for a colored motion picture depicting the story of the Independent telephone industry, LaPrade said prints of the film will be made available for showings by member companies in their local areas.

Newly elected officers of the Pennsylvania association are: President, W. M. Gottschall, Lansford; Vice President, G. M. Keefer, Gibsonia; Vice President, G. A. Ruhl, Lewisburg; Treasurer, H. Y. Smith, Columbia; Executive Vice President, A. C. Herbert, Harrisburg; and Secretary, M. Ethel Cunningham, Harrisburg.

Directors are: J. H. Swope, Myerstown; H. Y. Smith, Columbia; G. M. Keefer, Gibsonia; B. V. Cobler, Knox; W. M. Gottschall, Lansford; A. J. Sordoni, Jr., Dallas; G. A. Ruhl, Lewisburg; A. C. Glick, Birdsboro; R. B. Scott, Waynesburg; L. R. Thurston, Harrisburg; A. N. Seward, Meadville; H. G. Payne, Export; L. R. Shepherd, Erie; and K. B. Schotte, Kittanning.

Western Counties Tel. Assoc. Holds 50th Annual Meeting

THE Byron (Ontario) Telephone Co. virtually was forced to sell out to Bell Telephone Co. of Canada because of the annexation of Byron to London. V. W. Flynn, chairman of the Ontario Telephone Service Commission, revealed at the 50th annual conference of the Western Counties (Canada) Telephone Association.

Addressing the conference at the Hotel London, London, Ontario, Flynn stated that if Byron residents had remained outside the Bell system, they could conceivably have been charged long distance tolls for calls into London, even though the village will be part of the city under the annexation decision.

There is no legislation to require Bell Telephone to accept Byron Telephone Company calls at no charge, he said.

Moreover, the Ontario Municipal Board takes the "entirely reasonable" view that no two public utilities

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FOR QUALITY SUPPLIES

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NOT just because Lindsay provides prompt delivery of nationally known supplies exactly as ordered... but also because of the friendly, personal way we do business, we think you'll like Lindsay. Try us and see!

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ROWCO BRUSHKING *SPEEDS* BRUSH CLEARANCE

NEW MODEL 660 does the work of 6 men

The new Rowco Brushking Model 660 — now 50% more powerful with 3 H.P. *throughout* — slashes through brush and trees up to 9" dia. Takes the work and waste out of forest, woodland and park clearance jobs. Cuts clean at ground level. Reaches into ditches. Limbs and trims overhead. With trimmer-cutter attachment, makes short work of heavy grass and weeds. Guaranteed shatterproof blade — complete operator safety. Pays for itself in a hurry!

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ROWCO MFG. CO., INC.
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Spiraflex® CORD

BY GENERAL INSULATED WIRE WORKS, INC.*

*Licensed to manufacture under existing patents.

Telephone cord sets of proved performance backed by General Insulated's unmatched experience and know-how in the manufacture of quality telephone tinsel cordage:

Spiraflex HANDSET CORDS in bright colors with non-staining thermoplastic jackets in solid color extrusions matching color shade and sheen of telephone sets. Also non-staining black Neoprene jacketed cords. Both types available with or without integral moldings and terminations. Furnished in standard or extra long lengths.

STRAIGHT HANDSET AND DESK SET CORDS are available in non-staining thermoplastic constructions in matching colors and in black Neoprene.

GENERAL INSULATED WIRE WORKS, INC.

A DIVISION OF GENERAL CABLE CORPORATION
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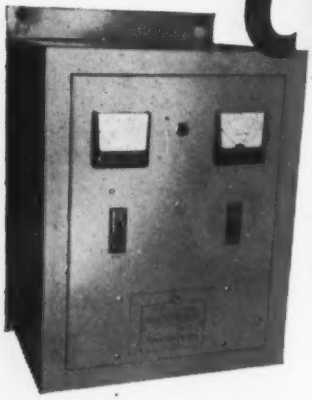
A NEW LINE OF *fully automatic* ACME MAGNISTROL

SILICON BATTERY CHARGERS



- NEWEST CIRCUITRY OF PROVEN DESIGN
- COMPLETELY STATIC MAGNETIC AMPLIFIER CIRCUITRY
- ±1% VOLTAGE REGULATION WITH ±10% LINE VARIATION
- FILTER COMPONENTS OPTIONAL FOR INAUDIBILITY ON TALKING CIRCUITS
- REMOVABLE CABINET SHELL; COMPLETE ACCESSIBILITY TO ALL CONTROLS

Standard Unit, Normally in Stock
1, 3, 6, 12 and 25 amperes; 24, 48 and 130 volt
Ask for Bulletin BC-324. Inquiries invited on units up to 300 amperes

CUSTOM EQUIPMENT DIVISION
ACME ELECTRIC CORPORATION
CUBA, NEW YORK
PLANTS IN CUBA, N.Y.—ALLEGANY, N. Y.

should operate within the same municipality, he said.

It was because of the annexation plan that the commission had refused to grant the Byron Telephone Co. permission to install a dial system in Byron, after having spent $247,000 on a similar system in Lambeth, he said.

"We could not be sure that when Bell purchased the system it would be willing to pay the full cost of converting Byron to dial," he said.

Shareholders of Byron Telephone Company voted May 9 to accept an offer of $900,000 from Bell for their 3,250-subscriber system.

Flynn told the conference that the next 10 years will see fewer Independent telephone companies in Ontario, but that those remaining will provide better service.

Both the Ontario government and Bell Telephone Company are giving the Independents engineering, technical and commercial assistance. Bell, he said, has expended more on this than has the government.

The golden age of the Canadian Independents began about 1910, when small communities organized co-operative or municipally-owned telephone systems. The number of Independents operating in Canada grew to 630 in the next 15 years.

But by 1950 over 100 Independents had been purchased or amalgamated and at the beginning of 1960 another 200 had gone. In the first few months of this year there have been further sales. The number of Independents is now about 300. Flynn estimated that there will be only 60 systems left by 1970.

Rising costs of operation continue to be the most pressing problem facing the telephone companies of North America, Keith W. Vogt, executive secretary-treasurer of the Minnesota Telephone Association, told the conference.

Vogt said Canadian and American systems have similar cost problems, although wages in Canada, he thought, will be lower while equipment prices will be about the same. Equipment price competition in the U. S. is very keen, he said.

Telephone companies in rural areas

Problems Got You Over A Barrel?

Why Not Bring Them To The

63rd Annual

CONVENTION

Of The

UNITED STATES
INDEPENDENT TELEPHONE ASSOCIATION

(The Keystone of Independent Telephony)

Conrad Hilton Hotel · Chicago, Illinois

OCTOBER 9-10-11-12, 1960

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438 Pennsylvania Building • • Washington, D. C.

Stewart

TEST EQUIPMENT

Locates Trouble FAST

COMMUNICATION TEST SET

Model JKR

Now available the well known Model JK unit for permanent installation.

19"x3½" relay rack panel.

Any number and value of loads.

All controls, ¾" spacing binding posts and jacks on panel.

Power supply attachments available to power unit from 115 volt AC or exchange battery.

Other characteristics of the unit are the same as the Model JK.

TRANSISTOR OSCILLATOR MODEL J—Voltage output, 0, —13, —16 DBM Frequency, 1000 Cycles; Output Impedance, 600 Ohms; Power, Self-contained 700 hour mercury battery. Stable frequency and voltage.

DB METER MODEL K — in 4 ranges from —20 to +42 DBM. DB Scale, red; 1, 5, 25, 125 Volts. Scale Black. Frequency response, up to 600 k. c. Minimum impedance, 18 K Ohms.

Model JK

Enables Carrier and Line Check at both 1000 Cycles and Carrier Frequency.

Set consists of TRANSISTOR OSCILLATOR Model J, DB METER Model K, Case and Leads.

STEWART BROTHERS
Division of Instrument Laboratories
315 W. WALTON PL., CHICAGO 10, ILL.

are moving toward a completely dial system, he said, and there is a trend toward underground cable, which, although 20 per cent more expensive, returns its extra cost in about 14 years.

Other conference speakers were: Alex Brown, manager of the Byron Telephone Co. (recently purchased by Bell); Roy Bieth, manager, Electrical Utilities Safety Association; Harold Riddle, Bell Telephone Co., Toronto; James Thomson, Buckingham, Quebec.

A presentation was made to Dr. Helen Doan McIntyre, Elgin Health Unit, whose father, the late Dr. Warren Doan, Harrietsville, founded the Western Counties Telephone Assoc.

New officers elected are: C. E. Janes, M. L. A., of Watford, Ontario, and A. H. Brown, Byron, Ontario, honorary presidents; Robert Risdon, Thorndale, Ontario, president; Roy Sweetman, Essex, Ontario, first vice president; Randy Gordon, Thamesville, Ontario, second vice president; John Roundell, Kirkton, Ontario, executive member; and H. J. Schmidt, Baden, Ontario, secretary-treasurer.

F. MARK CLARK

F. Mark Clark Retires: Williams Named Successor

F. MARK CLARK, 60, vice president for customer relations of the Rochester (N. Y.) Telephone Corp., retired September 1 after 32 years of service to the company. His successor as customer relations manager is Justin M. Williams, the company's present traffic manager. John F. Banks has been promoted to traffic manager from his present position as district traffic superintendent — city.

Clark is a native of Malone, N. Y., where he attended elementary and high schools. He is an alumnus of Davenport College, Davenport, Ia. and attended the University of Rochester evening school and the Rochester Business Institute. He began his work for the telephone company as a salesman in 1927. After holding several positions in the commercial department he became commercial su-

"Talking shop" at the 50th annual conference of the Western Counties, (Canada) Telephone Association are (from l. to r.): ROY SWEETMAN, Cottam; W. G. CHAPMAN, Dresden; ALEX H. BROWN, president, Byron; and HAROLD SCHMIDT; secretary-treasurer, Baden. More than 200 delegates attended the conference.

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Phelps Dodge Aerial & Duct Telephone Wire & Cable!

In every Phelps Dodge aerial and duct telephone wire and cable, dependability of product is recognized as the first requirement for satisfactory service.

Phelps Dodge achieves product dependability by combining years of manufacturing experience with the most modern research and development facilities throughout its fabricating process. This controlled method of building in quality *during* manufacture assures customers reduced maintenance costs and trouble-free service—important advantages that only true product dependability makes possible.

Phelps Dodge will gladly help you fill your aerial and duct wire and cable requirements, recommend the correct constructions to fit your needs. Just call your nearest Phelps Dodge sales office.

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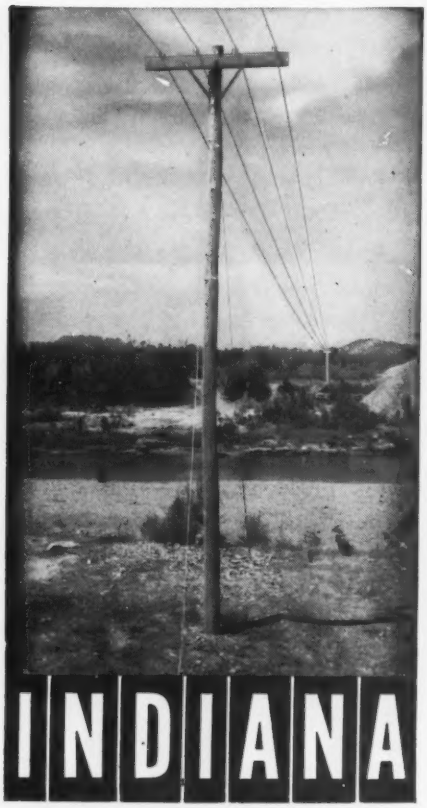
EXTRA HIGH-TENSILE TELEPHONE LINE WIRE
for low-cost Rural Lines

• Spans up to 600 feet in Heavy Loading, 650 feet in Medium Loading and 700 feet in Light Loading districts are possible where Crapo HTL-195 is employed. This extra long span construction results in marked savings in costs per mile of line. Pole structures can be reduced to a minimum. Fewer pole structures mean substantial savings both in materials and man-hours of labor. There is less hauling to be done, fewer holes to dig, less material to be handled, installed and connected.

Improved electrical qualities make practical typical subscriber loops of 14 to 15 miles with normal voltages and equipment. Also can be used for subscriber carrier.

Write for Engineering Manual No.TM-59



INDIANA

STEEL & WIRE CO., INC.
MUNCIE, INDIANA

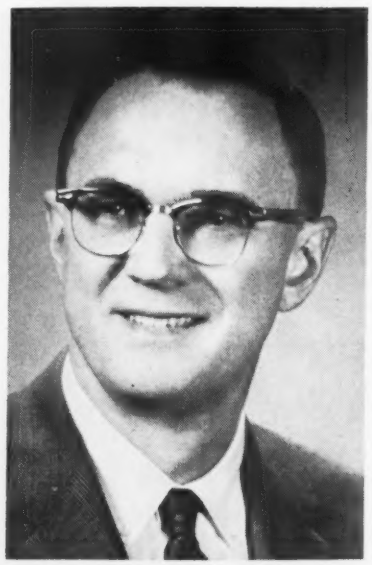
perintendent in 1955 and vice president for customer relations in 1959.

Justin M. Williams, the new customer relations manager, is a veteran of 30 years of service with the company. He joined the company in 1930

JUSTIN M. WILLIAMS

as salesman. Since that time he has held many positions in the commercial department and became traffic manager in 1959.

John F. Banks, the new traffic manager, is the former traffic superintendent for the New York Telephone



JOHN F. BANKS

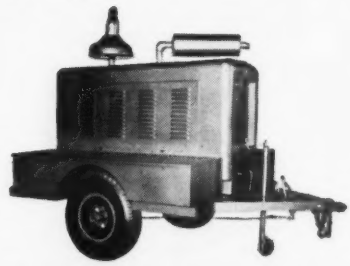
Co. in Buffalo. A native of Dunkirk, N. Y., and an alumnus of Syracuse University in the class of 1942, he joined the New York Telephone Co. as a traffic student in Albany in 1946 after serving four years in the Air Force during World War II.

Banks served the New York Tele-

There's VERSATILITY in TELEPHONE SYSTEM SERVICE and Portability with...

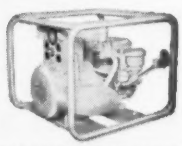
U.S.

Complete "versatility" is possible for telephone system service with portable U.S. Versa-Trailer standby emergency power units in sizes from 10 kw to 35 kw capacity.



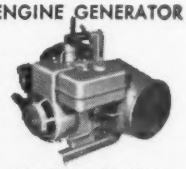
Units provide both single phase power for lights and 3-phase power for other needs. Many exchanges in an area can be served by a single unit.

Telephone systems use U.S. portable generating sets for on-the-spot power needs. Sizes 750 watts and larger, air-cooled.



ENGINE GENERATOR

Portable engine blowers provide convenient means of furnishing fresh air to manholes, or for ejecting smoke, fumes, etc.



ENGINE BLOWER

Motor driven blowers like engine driven counterparts, are invaluable for exhausting contaminated air.

MOTOR DRIVEN BLOWER

for complete information write . . .

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UNITED STATES MOTORS CORPORATION
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phone Co. traffic department in Albany, Monticello, Ithaca, Rochester and Buffalo before coming to the Rochester Telephone Corp. on April 1 of this year as district traffic superintendent — city.

Sunland-Tujunga Tel. Advances N. H. Beach

NORMAN H. BEACH, employed by Sunland-Tujunga Telephone Co. in 1949 as chief switchman, was recently named equipment supervisor.

Beach was born in Pontiac, Mich., in 1913, attended public schools in Pontiac and graduated from high school in 1931. Following graduation,

NORMAN H. BEACH

he spent 13 years at the printing trade, working as printer on the Pontiac Press, a daily newspaper.

During World War II he served in the United States Naval Reserve, where he received his electrical training. He attended A, B and C Schools in the Navy and was paid off Electrician's Mate, second class.

After the war, Beach entered the telephone business as switchman with the Associated Telephone Co., Ltd. (now General Telephone Co. of Calif.) at West Los Angeles, Calif. He held this position until March, 1949 when he joined Sunland-Tujunga Co.

His duties as equipment supervisor include supervision of central office installation and maintenance.

Illinois Consolidated Completes DDD Cutover

AN INTENSE marketing and customer education program paved the way for Illinois Consolidated Telephone Co.'s introduction to Direct Distance Dialing in the Mattoon-Charleston area.

Prior to the recent cutover, the

For the BEST in pole values specify
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FULL LENGTH TREATED
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PENTA
NORTHERN WHITE CEDAR POLES
Durable
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Dependable
Clean
When you specify reliable P & H Penta Poles you *know* your investment is sound, your aerial plant is safe for many years of dependable, trouble-free service. Overhead construction with P & H Penta Poles has been field tested and proved through more than 50 years of participation in telephony progress.
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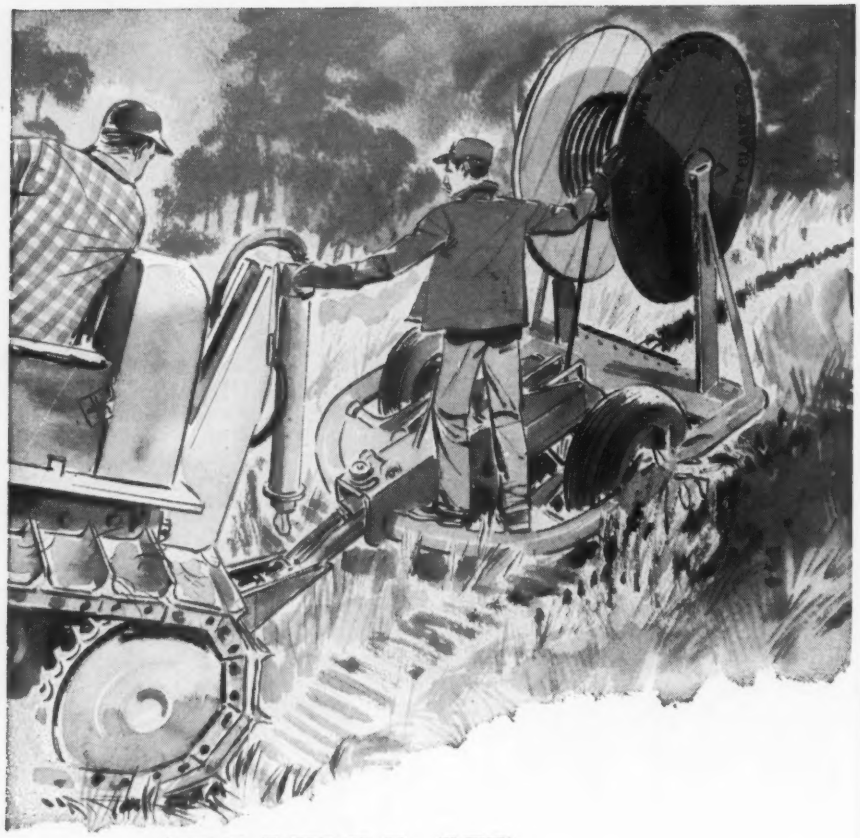

BURY IT
FORGET IT

Whitney Blake TELECABLE for Direct Burial, is made to last, to withstand the most "unfriendly" soil conditions and to give long, uninterrupted service underground.

It is quality that makes for true economy . . . that's why we can say "bury it and forget it."

WB TELECABLE — Type DB
Complies with REA
Specifications PE-23

Write for NEW
free Bulletin T-5

WB WHITNEY BLAKE CO.

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NEW HAVEN 14, CONNECTICUT

company conducted a large scale campaign to introduce the new service and show subscribers how they may save on telephone bills by dialing station-to-station DDD calls.

Over 500 PBX customers and large toll users were personally contacted during the pre-DDD campaign. The company also telephoned an additional 2500 customers, with service representatives reading a prepared script which highlighted the new service. Along with these activities, large demonstration units were prepared to show customers how DDD operates. Some 1100 persons viewed the demonstration.

Booklets, outlining procedures and area code number listings, were distributed to all subscribers to further illustrate DDD's advantages. An extensive newspaper advertising program was also used to tell the story.

Employes and families of Illinois Consolidated Telephone's Mattoon and Charleston exchanges were invited to attend a demonstration in Mattoon and a tour of the exchange.

The new DDD equipment — Strowger Automatic Toll Ticketing (SATT) — is the first Type 59 system to be installed in Illinois by Automatic Electric Co., Northlake, Ill. The checking operator system contains 37 ticketers, four tabulators and 11 transenders. Automatic billing is prepared from IBM punched cards.

The SATT apparatus serves the two main exchanges in Mattoon and Charleston, as well as neighboring Ashmore, Oakland, Humboldt, Gays, Winsor, Neoga, and Toledo. Along with the cutover, the Oakland exchange was converted to seven-digit All-Number-Calling.

Illinois Consolidated Telephone Company serves 55,000 subscribers in 35 communities of central Illinois.

$100,000 DDD Project Completed at Rock Creek

HISTORY was repeated July 29 when the Citizen's Telephone Co., Rock Creek, Ohio, initiated another "first" in Ashtabula County and completed a $100,000 modernization program.

The first direct distance dialing

telephone system was put into effect at 9:01 p.m. with a "in with the new, out with the old" ceremony.

William McCluskey, president of the company, and his wife Catherine, secretary, treasurer, put out the old board while two sons, Richard and Thomas, and their daughter, Mrs. Edward Trask, cut in the new equipment.

Twenty years ago the Citizens Telephone Co. made history with the first dial system in Ashtabula County.

McCluskey is "a very remarkable fella," Warren H. Chase, vice president of Ohio Bell, who was on hand for the cutover ceremonies, said.

This man with his wife and children has made this Rock Creek telephone company what it is today, Mr. Chase said. "This is an example of America at its best."

Immediately upon completion of the cutover, McCluskey walked to a telephone and dialed directly to Wilton, Conn. His call was to R. P. Bunyan, general plant manager of Ohio Bell.

Calif. Water & Tel. Names Rabourn to Personnel Post

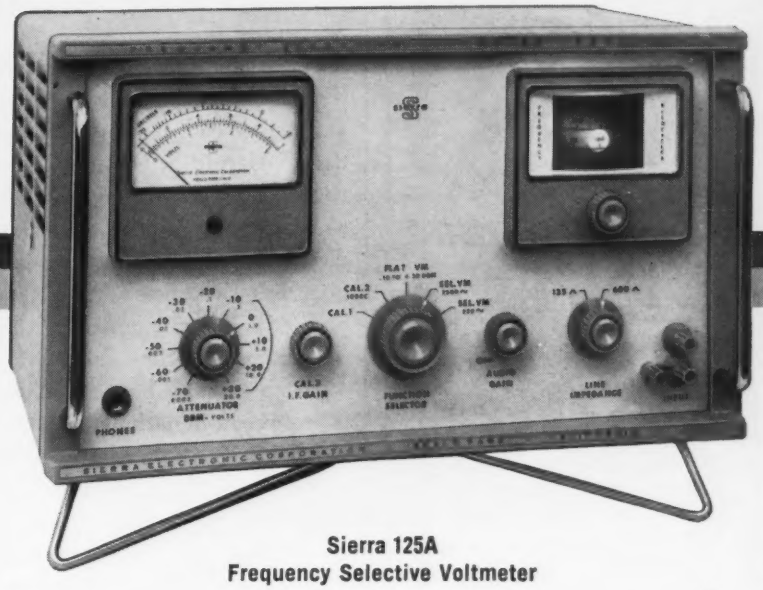
OWEN RABOURN, who has been with California Water & Telephone Co. for seven years and has served in a variety of positions, has been named director of personnel. He succeeds the late Ernest Aldrich.

Following graduation from high school, the new director of personnel joined West Coast Telephone Co., Everett, Wash., and remained there until he joined the Coast Guard.

Following his discharge, he enrolled at Arizona State College and in 1953 received his Bachelor of Science degree in Personnel Administration. Immediately afterward, he joined California Water & Telephone Co.

In 1955, Rabourn was transferred to the personnel department to set up a testing program for new job applicants. Later, he was named employment supervisor. From this position he was promoted to assistant to the director of industrial relations. He is a member of the Personnel Testing Council of Los Angeles and the Personnel and Industrial Relations Association.

New Tunable Voltmeter is also flat AC VTVM covering 1 to 600 KC



Sierra 125A
Frequency Selective Voltmeter

As a frequency selective voltmeter, Sierra 125A covers 3 to 600 KC continuously on a 40" scale. An up-converter with high IF and single conversion keeps spurious responses down 60 db. Crystal lattices provide two steep-skirted IF bandwidths — 250 cps or 2.5 KC.

As an AC VTVM, Model 125A offers response flat within ± 0.2 db, 1 KC to 600 KC, and measurement accuracy of better than ± 0.5 db. This additional mode increases the instrument's versatility and facilitates measurements on carrier systems.

Measurement range is —90 to +32 dbm in selective mode and —30 to +32 dbm in the flat mode. Signal levels are read directly on either 135 or 600 ohm lines, balanced or unbalanced. Line bridging loss is less than 0.25 db over the entire frequency range. Built-in 100 KC crystal oscillator provides accurate reference for both level and frequency calibration. Modular construction and etched epoxy glass circuit boards provide ease of access and operating dependability.

Price, $895.00 f.o.b. factory.

For complete details, see your Sierra representative or write direct.

sierra

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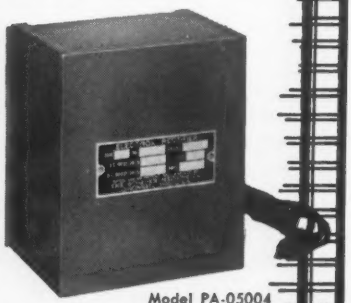

Model PA-05004
Schauer Battery Eliminator

Here's a sure SCHAUER power source for the operator's circuit on magneto switchboards

Schauer Type PA-05004 Battery Eliminator delivers constant, hum-free direct current to the operator's circuit. Equipped with relay for automatically transferring power to stand-by dry cells in the event of AC failure. Standard capacity is 4 volts DC at 0.5 amps. Steel case, for wall mounting is 5½"x6¼"x4".

Rectifier Division
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Kellogg Swbd. Changes Name To ITT Kellogg

A CHANGE in the name of International Telephone & Telegraph Corporation's communications division from Kellogg Switchboard & Supply Co. to ITT Kellogg was announced September 1.

"The new name was prompted by Kellogg's growing role in electronics and the broad field of communications," Harold S. Geneen, ITT president said. "In addition to continuing as a major supplier to the nations Independent telephone companies, Kellogg has progressed rapidly in the area of systems engineering and industrial applications."

In its expanded role, ITT Kellogg is prominent in national defense, principally as associate contractor for the Air Force's Atlas missile program. The Chicago-based division headed by George A. Strichman, president, is responsible for complete communications systems for all missile and space satellite launchings at Vandenberg Air Force Base, Calif.

The original Kellogg was founded in 1897, by Milo G. Kellogg, a communications pioneer. The firms first home was an old unused schoolhouse in Highland Park, Ill., and the first job was building a switchboard for St. Louis, Mo. — the largest switchboard built and housed in one exchange room at that time.

In its formative years, Kellogg introduced many significant changes in telephone communications, such as the "four-frequency" harmonic telephone system, which Mr. Kellogg invented in 1903. The first American-made cradle or handset model, known as the Grabaphone, was introduced to the industry by Kellogg in 1905, and was popular immediately. The Kellogg magneto switchboard, installed at Wusieh, China, in 1913, was the first telephone switchboard to be operated by Chinese girls.

In 1952, Kellogg became a wholly-owned subsidiary of ITT, and, in 1953, an ITT division. Since then, an electronic products plant and another installation for systems egnineering were added in Chicago, and outlying operations opened in Raleigh, N. C., Corinth, Miss., and Kansas City, Mo.

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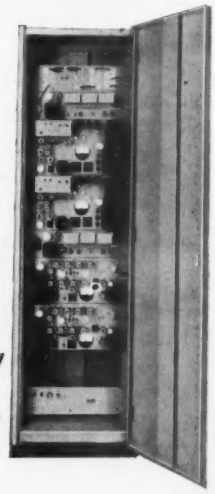
MICROWAVE

BUDELMAN POINT-TO-POINT RADIO SYSTEMS for the

- **2000 MC band**
- **960 MC band**
- **450 MC band**

With capacity up to 30 voice circuits.

Write today for technical data.



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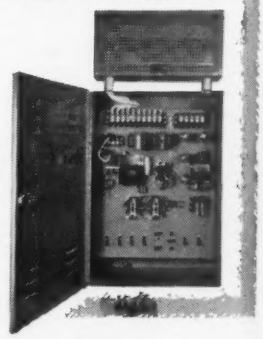
NEW! TOWER OBSTRUCTION LIGHTING CONTROL and LAMP FAILURE ALARM UNITS ... APPROVED
for unattended TELEPHONE COMPANY MICROWAVE RADIO-RELAY application.

MODEL LC-2102
For two light levels
(Shown with BR-1205 Resistor Ass'y.)



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... WITH BEACON DIMMING AND DUMMY LOAD RESISTORS

SIX MODELS AVAILABLE for 1, 2, and 3 light levels — with choice of test switches or circuit breakers. All units provide a separate signal upon failure of each top lamp, and for failure of any one or all side light lamps on the tower. Choice of switches or circuit breakers in maintenance test circuits . . . circuit breakers provide individual overload protection for each lamp circuit on the tower.

Request Descriptive Bulletin HPS-153

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MANUFACTURERS OF
300MM Beacons, Obstruction Lights, Photo-Electric Controls, Beacon Flashers, Special Junction Boxes, Microwave Tower Light Control and alarm Systems, Tower Isolation Transformers, and Complete Kits for: Tower Lighting, Sleetmelter Power and Control.
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See It At The USITA Convention—Room 639A

GT&E International Elects New Officers

WALLACE G. DEMPSEY has been elected vice president and general counsel, and Joseph A. Rodriguez has been elected controller of General Telephone & Electronics International, Inc. The announcement was made by Gene K. Beare, president of the recently formed international manufacturing, marketing, and engineering subsidiary of General Telephone & Electronics Corp.

WALLACE G. DEMPSEY

Born in Chicago, Ill., Dempsey was graduated from Columbia University with a B.S. degree in Electrical Engineering in 1945. Three years later, he obtained his LL.B. degree from the Columbia Law School. Following graduation, Dempsey was employed by a Washington, D. C.

JOSEPH A. RODRIGUEZ

IMPROVED DESIGN!

Extended mounting slot now fits ALL standard 12" or 8" pin spacings . . . eliminates costly re-boring.

Case® ALUMINUM CROSS-ARM TRANSPOSITION BRACKETS.

Many new carrier circuit designs call for a reduction in wire spacing from 12" to 8". Normally this means thousands of new pin holes must be bored . . . an expensive and time-consuming job. Now . . . the new, improved Case cross-arm transposition bracket with the extended mounting slot fits all standard 12" or 8" pin spacings . . . eliminates the need for costly re-boring, and saves you thousands of dollars per year. If you are planning to re-space and transpose wires from 12" to 8" spacings, be sure to check first with Case.

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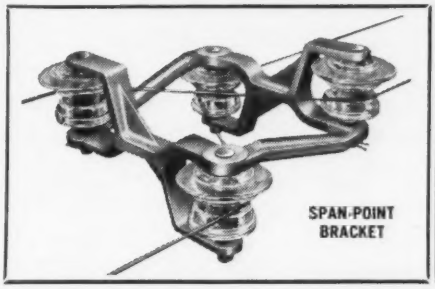

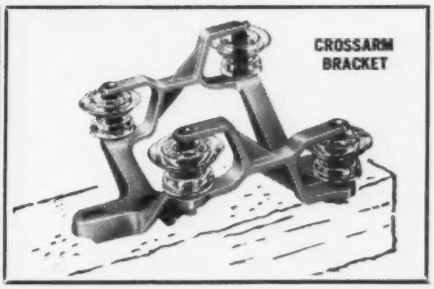

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TYPE 251A

VOICE FREQUENCY REPEATER

A new exciting development from Budelman. Four of these new transistorized repeaters fit on a mounting shelf in only 1¾ inches of rack space.

Up to 20 db gain in both directions. Battery drain from 12, 24 or 48 volt battery is only 3.4 milliamps. Low price, high reliability. Send for data sheets today.

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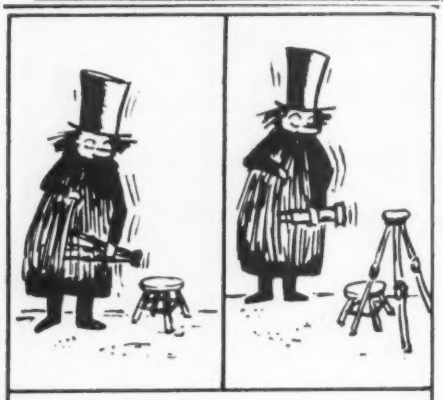

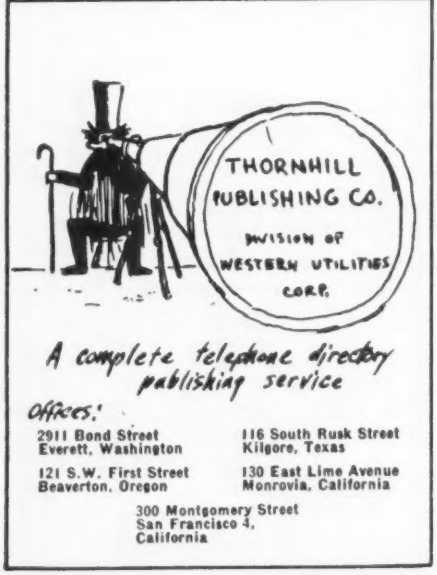

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law firm, and later worked with the U. S. High Commission for Germany as legal officer from 1950 to 1952. He subsequently joined Sylvania Electric Products Inc., as counsel for the International Division.

Rodriguez also was born in Chicago, Ill. He attended the University of Pittsburgh, and was graduated with a B. S. degree in business administration in 1946. From 1946 to 1953, Rodriguez was employed by a subsidiary of U .S. Steel Corp., National Tube Co., where he held a variety of positions in the field of cost analysis and cost accounting. He joined Sylvania in 1953, where he served on the corporate controller's staff until his appointment as controller of Sylvania Electric (Canada) Ltd., in 1954. In 1958, Rodriguez became manager of internal auditing for Sylvania Electric Products Inc.

1961 Electronics Catalog

ALLIED RADIO Corporation has announced release of its 1961 catalog describing electronic equipment. Special emphasis has been placed on electronic equipment for industry. The new 576-page catalog lists over 48,000 items and includes 240 pages in rotogravure.

The catalog includes extensive listings of parts and equipment for industrial maintenance, research, and production requirements. Immediate delivery from stock, factory prices, and quantity discounts are features of special interest to the industrial purchaser.

Allied's new 1961 electronics catalog may be obtained without charge, upon request, on your company letterhead. Write to *Allied Radio Corp., 100 N. Western Ave., Dept. TE&M, Chicago 80, Ill.*

Stromberg Names Orman Industrial Sales Mgr.

GRANT G. Orman has been appointed manager of industrial sales in Stromberg-Carlson's Telecommunication Division.

Orman has been with Stromberg-Carlson since 1942. In his new position he succeeds Edgar R. Sears, Sr.,

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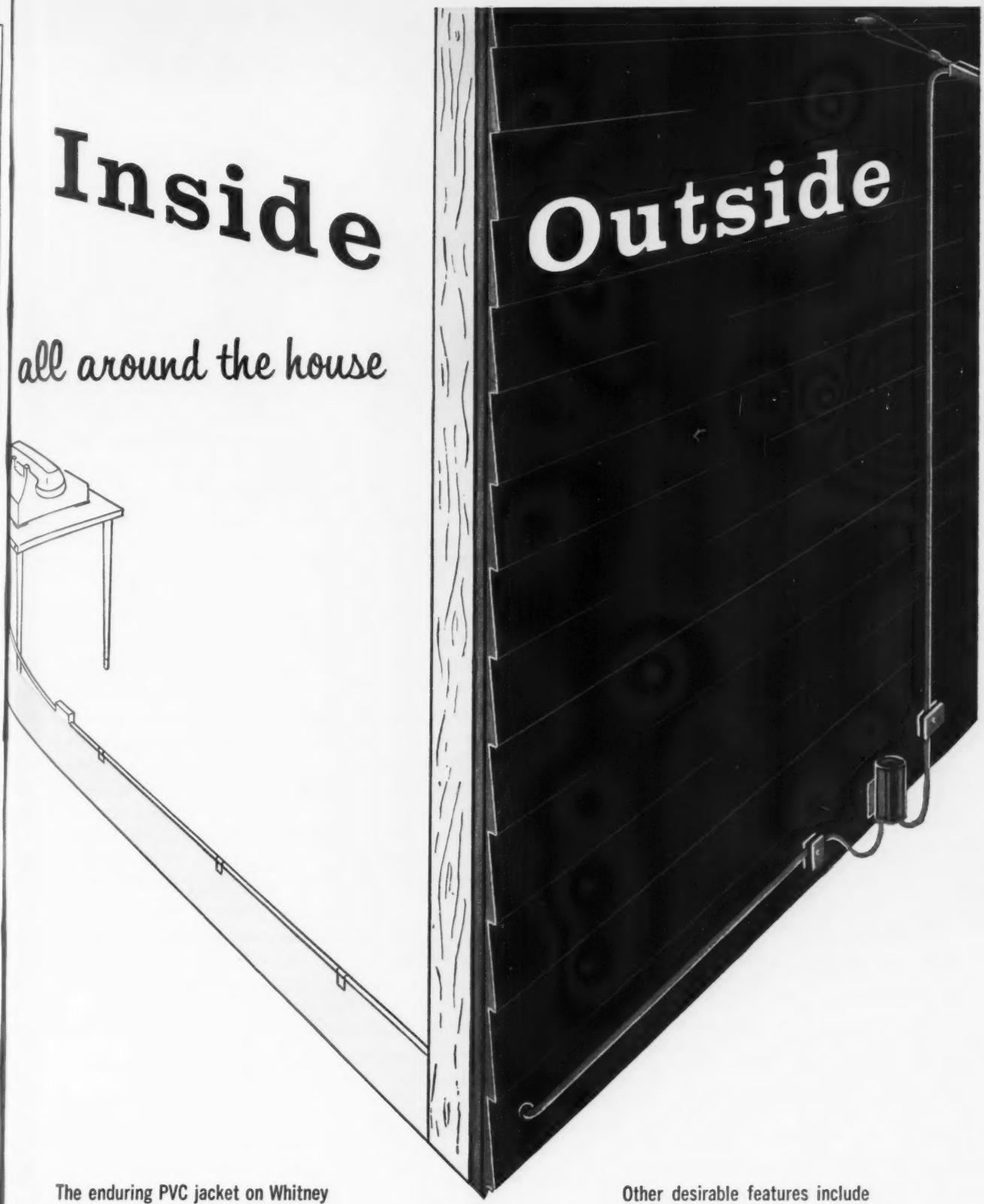
all around the house



The enduring PVC jacket on Whitney Blake's new station wire makes it ideal for outside use. Its pleasing beige tone harmonizes with any inside decoration assuring subscriber satisfaction.

Other desirable features include PVC insulation; twisted conductors; convenient knock-out cartons with length clearly marked.
Complies with REA Specification PE-20

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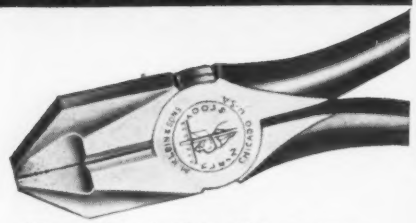
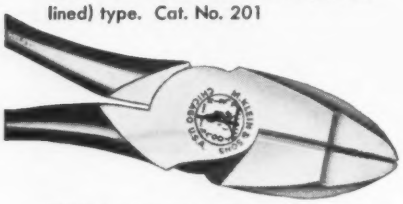
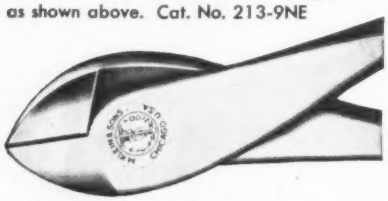


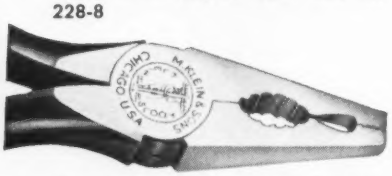
The Original Klein Side Cutting Plier—Also available in NE (Streamlined) type. Cat. No. 201



High Leverage Plier—Extra high leverage permits cutting extremely tough wire. Also available in the standard type as shown above. Cat. No. 213-9NE



High Leverage Oblique Cutting Plier—A recently introduced plier designed to cut toughest wire. Cat. No. 228-8



Electrician Conduit Plier—Reams inside and outside of conduit, tightens lock nuts in outlet boxes. Cat. No. 333-8

"Since 1857" the name Klein has stood for the finest in tools and equipment for linemen and electricians. It is the uncompromising high quality back of the name Klein that has won Klein Pliers their place in the hands of men who know good tools. Klein Pliers are now available in a wider variety of styles and sizes than ever before. Be sure the pliers you need carry the Klein trade-mark.

Klein Catalog Free—This new Klein catalog giving complete information on Klein tools and equipment for linemen and electricians will be sent on request. Write for your copy.

Ask Your Supplier—Foreign Distributor: International Standard Electric Corp., N.Y.

Mathias Established 1857 **KLEIN** & Sons Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

EDWARD C. FLINT has been appointed a sales engineer in the Chicago Branch of Stromberg-Carlson's Telecommunication Division. Flint brings 24 years of telecommunication experience to his new position.

HARRY G. BEGOR has been appointed manager of marketing administration at ITT-Kellogg. In this position, Begor will be responsible for administrative activities within the marketing department, including personnel.

who recently was named manager of the San Francisco Branch.

In his first telecommunication job Orman designed automatic testing equipment in the inspection engineering department. Later, he gained experience in the telephone engineering section and in national sales engineering. In 1954 he joined the industrial sales department, where he was appointed a senior sales engineer in 1957.

Exide Advances C. J. Moore To Vice Pres.-Marketing

C. J. MOORE, former general sales and marketing manager of Exide Industrial Division, The Electric Storage Battery Co., has been promoted to vice president-marketing of the division.

In his new position Moore will continue to direct at the highest policy level all national sales and marketing activities for Exide industrial batteries, battery-charging equipment and related components.

Moore has for the past seven years helped conceive and shape a sales program which today finds Exide prepared to launch what it believes will be the golden age of packaged power.

Moore continues to make his headquarters at divisional headquarters at Exide's largest plant, Rising Sun and Adams Avenues, Philadelphia.

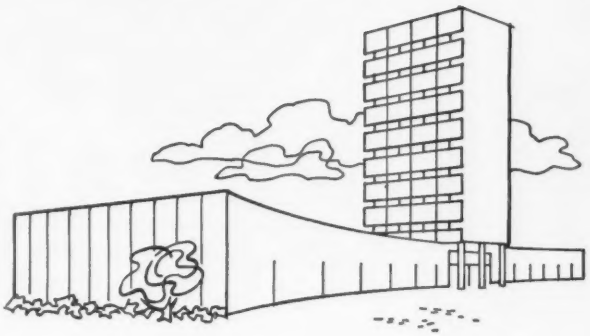
Joining Exide in 1935, Moore began as a salesman in the Pittsburgh branch. In 1941, he was transferred to company headquarters as supervisor of motive power sales. He returned to Pittsburgh in 1946 as assistant branch manager and became branch manager there in 1947. He again was transferred to Philadelphia in 1949 as manager of the railway and motive power sales division and has been successively promoted to sales manager and general sales and marketing manager.

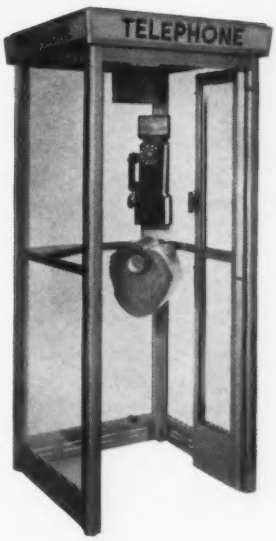
Van Bosse in New Post at Automatic

JOHN G. Van Bosse has been appointed supervisor of electronic switching systems design and development for Automatic Electric Laboratories. He succeeds Richard C. Stiles, who joined the staff of General Telephone & Electronics Laboratories, Inc.

Van Bosse joined Automatic Electric Laboratories in 1957 as a project engineer, and has been engaged in research and development of electronic crosspoint switching. He is a member of the Institute of Radio Engineers.

PROVED BEST in design





Intelligent engineering always includes appearance. Slim posts, good proportions and a variety of glass and solid panel arrangements make this the most attractive booth available.

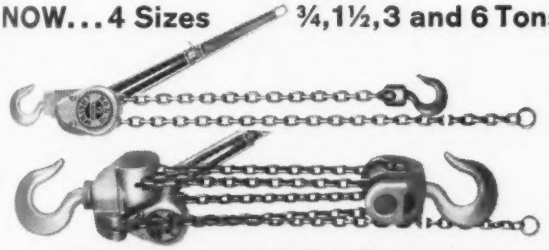
the BN Booth

For full particulars, consult your distributor or write direct ...
Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

New ¾-ton Type "C" Pull-A-Way

NOW... 4 Sizes ¾, 1½, 3 and 6 Tons



WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6-ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 12½ lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

Write to our York, Pa., office for Bulletin DH-56

WRIGHT HOISTS

Wright Hoist Division • American Chain & Cable Company, Inc. ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

You can add more circuits to your existing communications lines!

fast, easily at low cost WITH TYPE PLC CARRIER

With Budelman Type PLC Carrier, you can add up to *four* private-line stations, or other circuits, to almost any existing telephone line — without running additional wire lines — for less than the cost of three miles of single-pair wire line!

Offers four stackable channels — 12 to 96-kc range. User terminal is Underwriters approved when ordered complete with our steel cabinet and dust-cover.

Type PLC can also provide additional trunk lines to PBX, PABX, and Key systems.

Write or call us for Bulletin 758-B

BUCKEYE TELEPHONE & SUPPLY CO.
1250 Kinnear Rd. • Columbus 21, Ohio
Phone—HUdson 8-0655 (Area Code 614)

POLE PRUNERS

No. 11
Cuts up to 1" branches. A strong, durable, easy cutting 18 foot tree pruning unit. Spruce extension poles in 6 foot sections, with telescoping aluminum joints.

No. 12
Cuts up to 1½" branches. Pruner head is malleable iron casting, husky, unbreakable. Smooth, easy cutting action.

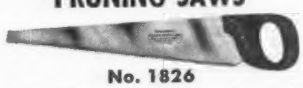
LOPPING SHEARS

Heavy duty, fast easy cutting loppers designed for utility use.

No. 75
Compound lever cutting action, smoothly slices through 1¾" to 2" branches.

Nos. 525, 530
The famous "Tiffany" pattern lopping shears 25" and 30" models. Cut branches up to 1¾".

PRUNING SAWS



No. 1826
26" blade of Sandvik Swedish steel especially designed for true work. For those spots where a chain saw can't operate.

Send for literature and additional information on pruning tools of all types.

Quality Tools
SEYMOUR SMITH
Since 1850

SEYMOUR SMITH & SON, INC.
Oakville, Connecticut, U. S. A.

Sales Representative
JOHN H. GRAHAM & CO. INC.
105 Duane Street, New York 8, New York

Leich Sales Corp. has announced the appointment of RAYMOND J. RANTMAN as representative in California. The addition of Mr. Rantman will improve Leich's service to Independent telephone companies in southern California and parts of Nevada and Arizona. Rantman has been with Leich for almost eight years and is familiar with the needs of the Independent industry.

Carman R. Hughes Elected Vice Pres., GT&E Int'l.

CARMAN R. HUGHES has been elected a vice president of General Telephone & Electronics International Inc., international manufacturing, marketing, and engineering subsidiary of General Telephone & Electronics Corp.

In his new post, Hughes is responsible for coordinating all manufacturing, sales, and engineering activities in Canada, involving subsidiaries and associated companies. In addition to serving as a vice president of GT&E International, he will continue to serve as president of Automatic Electric (Canada) Limited, Automatic Electric Sales (Canada) Limited, and Canadian (B.C.) Telephones and Supplies Ltd. His headquarters are at 100 Strowger Boulevard, Brockville, Ontario, Canada.

A citizen of Canada, Hughes was born in Oshawa, Ontario. He was graduated from that city's Collegiate College and Vocational Institute, and subsequently attended the Radio College of Canada.

Following service with Northern Electric Company in Canada, Hughes

REPAIR AND COLOR

BRIGHT NEW COLORS BUILD NEW BUSINESS

DIALS—repaired or modernized fast with satisfaction guaranteed by exclusive, Hallamore designed electronic test apparatus.

TELEPHONE INSTRUMENTS AND PAY STATIONS — given the **new look** (changed from black or faded color to your choice of user-attracting shades by the magic of tough, durable Hallaplast) while they are brought to peak efficiency.

—Hallamore, Division of The Siegler Corporation/ 714 N. Brookhurst St./Anaheim, Calif./ PRospect 4-1010/D.D.D. area 714.

HALLAMORE

Be Sure of Permanent Protection

NATCO CLAY CONDUIT provides permanent, low cost protection for Underground Telephone Cables. Available in a full line of shapes.

NATCO CORPORATION
327 Fifth Ave., Pittsburgh 22, Pa.

joined Automatic Electric Sales (Canada) Limited in Toronto in 1941, and was appointed manager of the Telephone Sales Division in 1950. He was elected vice president of that company in 1953, and later the same year was elected president of the organization as well as president of its manufacturing affiliate, Automatic Electric (Canada) Limited. He was elected to the additional post of president of Canadian (B.C.) Telephones and Supplies Ltd. in January, 1959.

During World War II, Hughes served in the R.C.A.F. as a Flight Lieutenant.

Col. Julian A. Dobrski Elected Vice Pres., GT&E Int'l.

COL. JULIAN A. DOBRSKI has been elected a vice president of General Telephone & Electronics International Inc., a newly-formed international manufacturing, marketing, and engineering subsidiary of General Telephone & Electronics Corp.

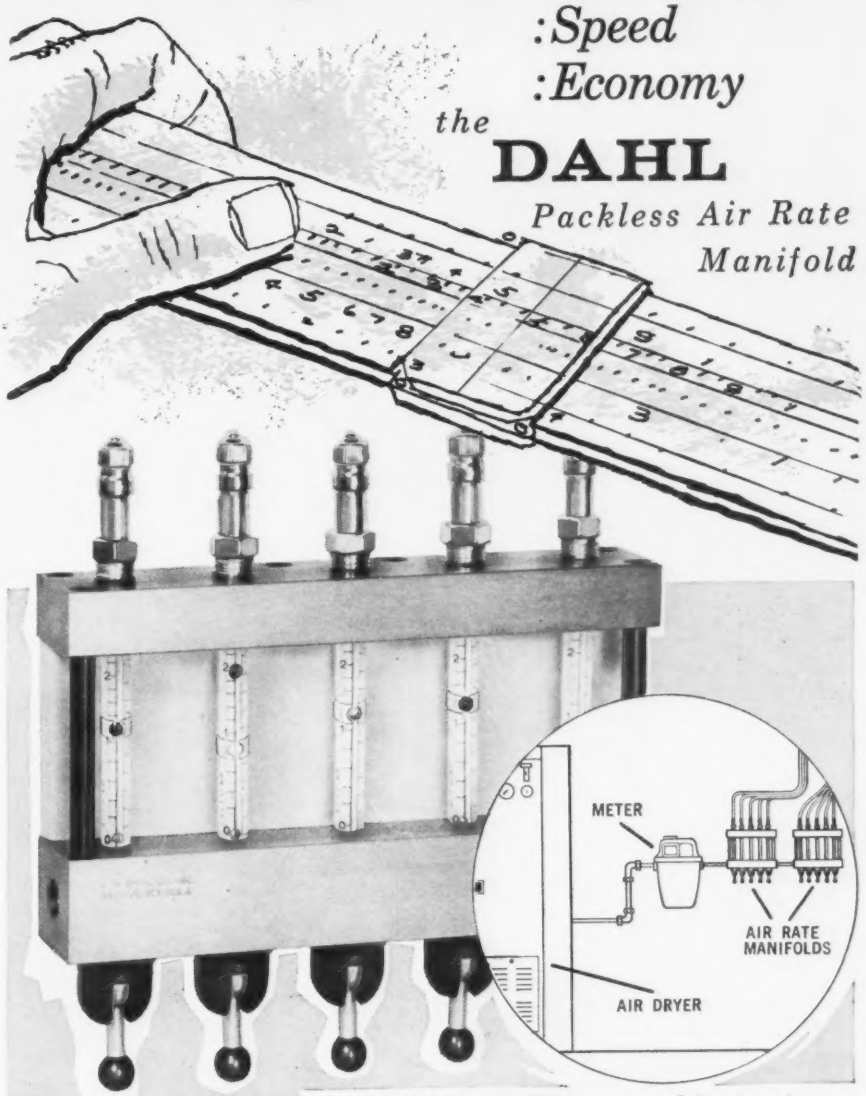
In his new post, Colonel Dobrski is responsible for all manufacturing, sales, and engineering activities in Europe, North Africa, and the Middle East, involving subsidiaries and associated companies. His headquarters are at 40 Rue du Rhone, Geneva, Switzerland. Col. Dobrski will continue to serve as a vice president of Automatic Electric International, Inc.

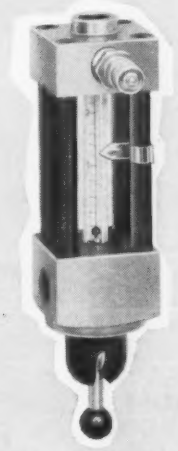
A naturalized British citizen, Colonel Dobrski was born in Italy and educated in Italy, Spain, and France. From 1923 until 1940, he was associated with J. Bourdelier S.A., manufacturers of yarns and textiles with plants in France and affiliates throughout Europe. Colonel Dobrski was president of this company at the start of World War II.

During the war, he served with the British Army in the Mediterranean area. Twice wounded, he was decorated with the Military Cross, the Order of the British Empire, and as a Commander of the Order of St. George.

In 1946, Colonel Dobrski rejoined J. Bourdelier S.A. as president, but resigned in 1949 to become a vice president of Automatic Electric International.

Designed for: *Efficiency*
: Speed
: Economy
the
DAHL
Packless Air Rate Manifold





Individual Air Rate Indicators also Available

This unit is actually a group of 5 separate indicators ganged together into a single, compact unit which requires fewer connections than separate indicators would demand. Each indicator has its own toggle shut-off to provide a means of disconnecting the individual cable from the gas source without affecting the flow to other cables. A pressure testing valve is mounted in the upper block of each unit of the manifold to measure cable pressure or introduce an auxiliary supply of gas on a temporary basis.

The air rate manifold employs both a glass and a stainless steel indicator ball in each gauge. When gas flow exceeds the maximum rating of the lighter glass float (2½ SCFH), the stainless steel float rises giving accurate readings from 2½ to 7½ SCFH. Sliding reference pointers on each gauge give a fast visual check on day-to-day changes in flow rate for each system.

All connections are anodized 24 S-T aluminum.

CALL OR WRITE FOR CATALOG T-1
CLIFFORD 3-9500
86 TUPELO STREET, BRISTOL, RHODE ISLAND

GEORGE W. DAHL COMPANY INC.

VALVES AND CONTROLS FOR COMMUNICATIONS, PROCESS, AIRCRAFT AND MARINE INDUSTRIES

ALPHADUCT

the source for all your buried wire needs

UNDERGROUND DISTRIBUTION AND SERVICE WIRE • CAT. No. VA-162-PBC

TWO PAIR BURIED SERVICE WIRE • CAT. No. VA-204-TSCW

UNDERGROUND SERVICE WIRE • CAT. No. N-162-TOC-DB

UNDERGROUND DISTRIBUTION AND SERVICE WIRE • PER REA PE-24

When you specify Alphaduct wires for your buried plant, or any of Alphaduct's quality line of telephone wires — you buy the know-how of the recognized leader in the manufacture of insulated wires for the Independent Telephone Industry.

National Distributors: Automatic Electric Sales Corp., Northlake, Ill.; Leich Sales Corp., 427 W. Randolph St., Chicago, Ill. **Regional Distributors:** Buckeye Telephone & Supply Co., Columbus, Ohio; The Lindsay Telephone Supply Co., Cleveland, Ohio; Pankey Supply Co., Charlottesville, Va.

ALPHADUCT WIRE AND CABLE CO. NEW BRUNSWICK, N. J.

Stromberg-Carlson Names Woolley To K. C. Post

MYLES L. WOOLLEY has assumed the position of sales engineer in the Kansas City branch of Stromberg-Carlson's Telecommunication Division, according to an announcement by T. C. Thompson, general manager

MYLES L. WOOLLEY

of commercial sales for the division. Stromberg-Carlson is a division of General Dynamics Corp.

Woolley is a former resident of Kansas City and previously served telephone operating companies in that area in sales capacity. He has been in telecommunication work for 38 years, and with Stromberg-Carlson for 21 years in various sales and engineering positions. He returns to Kansas City after a period as an industrial sales representative working out of the San Francisco branch. Previously he was a sales engineer in the Rochester headquarters, at the Kansas City branch, and on the West Coast. His earlier communications experience included positions with the Pacific Telephone & Telegraph Co., the Radio Corp. of America, Radio Sales & Service, Seattle, Wash., and the Western Electric Co.

Amplifier Systems

CONSOLIDATED Electrodynamics Corp. offers a two-page illustrated bulletin describing the Type 1-127 20-kc Carrier Amplifier System. Bulletin 1127 is available from *CEC, 360 Sierra Madre Villa, Dept. TE&M, Pasadena, California.*

TELEPHONE MARKET PLACE

Largest Circulation Serving The Telephone Industry

HELP WANTED

CABLE SPLICERS, Station Installers. Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1800 Johnson Street, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

AMBITIOUS MEN — Qualified as station installers, equipment installers, cable splicers, linemen. Work in midwest, Harris-McBurney Co., Inc., P. O. Box 267, Jackson, Michigan.

AN OUTSTANDING Area Engineer with the following experience is needed immediately — Outside Plant, Special Services, PBX-PABX, Budgeting, Minor C.O.E. and Cost Studies. This position is with a large expanding independent telephone company ideally located in Florida. Salary commensurate with experience and qualifications. Please send resume and photograph to Box 130, Telephone Engineer. All replies confidential.

EXPERIENCED COMMERCIAL MANAGER for a rapidly expanding REA financed Class A company. Responsibilities include merchandising management for 9 dial exchanges serving total of 3,700 stations. Please submit references and complete resume to the attention of General Manager, Western States Telephone Company, Inc., Box 305, Holbrook, Arizona.

PROJECT MANAGER
STAFF ENGINEERS
OUTSIDE PLANT
ENGINEERING SUPERVISOR

Immediate openings in the above categories for those well qualified. Broad communications engineering experience is required, combined with a valid history of supervisory experience.

•

Opportunities will be unlimited with a new and growing division of a long established progressive firm.

•

Submit a complete resume including minimum salary requirements in strict confidence to:

MR. H. J. RECKAS,
PERSONNEL MGR.

Advanced Communications Engineering

A Division of
Cook Electric Company
Chicago, Illinois

6038 Twenty-Eighth Avenue, S. E.
Washington 23, D. C.

POSITION WANTED

FAMILY MAN, 15 years experience, station installations, repairman and line foreman desires position with progressive Independent. Available immediately — Reply box 131, c/o TE&M, 7720 N. Sheridan Rd., Chicago, Ill.

FOR SALE

NORTH McBERTY MCX-500 ALL RELAY SYSTEM—400 private lines equipped with Code Ringing for 8 parties per line. Maximum 3200 Party Lines (100 Lines Additional Capacity).

4 Groups, 9 links per group, 9 manual office trunks, 20 pay station lines, 4 P.B.X. Groups, 8 outgoing and 7 incoming trunks with necessary power and signalling equipment for operation.

Two 110 Volt Rectifiers for Charging Battery, operated on 24 Volt DC System.

Condition Excellent—used by Southern Bell Telephone Company. Approx. 10 Years Old. Can be added to other existing equipment. Fully automatic—no personnel needed to operate. Blueprints and test equipment included in Purchase Price. Ideal for small town where a modern communications system is desired. Also ideal for a community, large company or plantation style town where private company controls its own telephone exchange.

AVAILABLE FOR INSPECTION GREENVILLE, S. C.

GENERAL PURPOSE MACHINERY & EQUIPMENT CO., S.A.
505 — 8th Avenue NEW YORK 18, N. Y.

FOR SALE

MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wisc.

THREE PEATROPHONES — Model K-59-23 made by Telephone Answering & Recording Corporation, New York. Best offer accepted F.O.B., Pine Grove, Pa. Lycoming Telephone Company, Pine Grove, Pa.

WANTED TO BUY

TELEPHONES — Any condition. Desk stands, wall sets, etc. Advise quantity available. Write Box 78, c/o TE&M.

WANTED — All makes, old telephones. Our truck will pick up and pay you cash on the spot. Telephone Co., Turtle Lake, Wisconsin.

CONSIDER purchasing any small Telephone company Box 129, c/o TEM, 7720 Sheridan Rd., Chicago, Illinois.

BELTS-CLIMBERS

BELTS — CLIMBERS — Complete Linemen's equipment, W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.

BOOTHS

BOOTHS — Telephone — Outdoor — Indoor — Steel — Stainless Steel — Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn 37, N. Y.

NORTH ELECTRIC RELAYS

(RECONDITIONED

#333-H Relays 33 Point with 250 ohm coil
#505-H Relays
#34-B-20-H & H-1-CCC-20 SPL Line Relays(LR)
#2-B-07-1-7-JJ-18 Cut-off Relays (CO)
#6-B-29-1-5-DDD-20 Lock-out Relays (LO)

BATTERY CHARGERS

North Type 24008 48 Volt 8 Amp (220 Volt Input)
North Type 24006 48 Volt 6 Amp (220 Volt Input)
North Type 24005 48 Volt 5 Amp (110 Volt Input)

TYPE 30 PABX

North Type 30 All Relay PABX in 6 ft. cabinet. Equipped for 3 Trunks 5 Links and 25 Lines, less Battery Charger and Batteries. (As removed from service — very good).

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR ROAD COLUMBUS 21, OHIO
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CABLE FOREMAN

An unusual opportunity exists for a well-qualified telephone outside plant construction foreman who is particularly well-versed in gas pressurized cable techniques.

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INSTALLATION SUPERVISOR

MAINTENANCE SUPERVISOR

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Candidates in the above categories must possess extensive inside plant experience with particular emphasis on carrier system installation checkout and maintenance.

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Submit confidential resume including past experience in strict confidence to:

MR. H. J. RECKAS,
PERSONNEL MGR.

Advanced Communications Engineering

A Division of
Cook Electric Company
Chicago, Illinois

6038 Twenty-Eighth Avenue, S. E.
Washington 23, D. C.

TELEPHONE CABLE FOR SALE

BELOW FACTORY COST

PAPER WRAP LEAD
SHEATHED TELEPHONE CABLE

*11 pair	#19 AWG	40,000 ft.	
*(2500 ft reels)			
26 pair	22 AWG	43,000 ft.	
*26 pair	24 AWG	15,000 ft.	
*(3500 ft reels)			
101 pair	24 AWG	3,000 ft.	
303 pair	22 AWG	2,000 ft.	

OUTSIDE PLASTIC TELEPHONE CABLE

11 pair	#19 AWG	5,065 ft.
11 pair	22 AWG	5,280 ft.
11 pair	24 AWG	4,140 ft.
16 pair	19 AWG	4,065 ft.
16 pair	22 AWG	2,635 ft.
*16 pair	24 AWG	27,000 ft.
*(5000 ft. reels)		
51 pair	24 AWG	3,400 ft.
51 pair	22 AWG	1,000 ft.
76 pair	24 AWG	458 ft.
76 pair	22 AWG	5,645 ft.
101 pair	19 AWG	1,235 ft.
101 pair	22 AWG	1,300 ft.

Other sizes and constructions available in stock including armored, rubber and lead telephone cable.
Samples and Quotations on request.
Let us supply all your cable needs from our extensive stock of communication, switchboard and power cables.

UNIVERSAL WIRE & CABLE
2921 N. Paulina, Chicago 13, Ill.
EAstgate 7-4777
Warehouse stocks in Los Angeles, Houston and Denver.

CONSTRUCTION EQUIPMENT

BORING MACHINES, EARTH — Highway Trailer Co., Edgerton, Wisc.

COIN COUNTERS

PAY PHONE COLLECTIONS are accurately counted and proven with a fast Coin Counting Machine. Rental rate is insignificant. Watkins Company, Box 116, Napoleon, Ohio.

CORDS

CORDS, Switchboard (with or without plugs), Instrument (straight and retractible cords in eleven colors. — Commercial Cord Co., Inc., 26 Main St., Clifton Springs, New York.

YOUR DIALS

Exclusive Materials and Techniques Applied to All Makes and Types
Reconditioned by Specialists

DIAL HAVEN INC.
P. O. BOX 655, MONROE, N. Y.
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DECALS

Made for trucks and equipment
Small or large quantities
Write for free catalog.

MATHEWS COMPANY
827 S. Harvey **Oak Park, Ill.**

CABLE SALE — Big Discounts

SUBMARINE CABLE Lead (All New) 21 Pair #19 Ga. Paper Ins. Lead Covered, ...one length.
Double Steel Wire Armor, two Layers Jute .....2100 Ft.
26 Pair, #19 Ga., As Above,....14000 Ft. (800 & 500 Ft. Lengths)
51 Pair, #19 Ga. As Above, one length. .....2,000 Ft.
OTHER CABLE 11 Pair, #19 Ga. Paper, Lead (4500 Ft. Reels) .....22,000 Ft.
7 Quad. #19 Ga., Paper Lead 100 M Ft.
7 Quad. #19 Ga., Plastic PVC .....5,300 Ft.
37 Quad. #19 Ga., Paper Lead 1,050 Ft.
51 Pair #19 Ga., Paper Lead ..1,200 Ft. (plus 4 #16 Shielded Pair with poly-eth, insulation) video.
303 Pair, #22 Ga. Ankoseal 775P .....2,300 Ft.
5 Pair, #19 Neoprene (Latex Ins.) .....50 M Ft.
Spiral 4, 1 Star Quad, #18 Stranded, Neoprene Jacket ⅜" OD, Self-Supporting (also suitable for direct burial) 1320 Ft. Reels with Quick Connector. (6 MH Loading Coils Built Into Connector) ..150 M Ft.

TERMINALS Lead Stub and no Stub Types Exterior & Interior-LOADING COILS
DROP WIRE, New #.104 Copperweld 40%, twisted Pair, Heavy Neoprene Jacket .....$40. M. Ft.

#18 Ga., Copperweld, Neoprene, Reinforced Parallel, Lengths Average 500 Ft., (Used) ..... $10. M. Ft.
FILTERS, Carrier H.C. O Type. 538D "O" Carrier (219S) New, Pole Mtg. $50.00
DRAINAGE COILS, #257A Retard, W. E. $5.00
2 Coils on 19" Mtg. with Protectors $10.00
As Above With Galv. Pole Mtg. Can ..$12.50
PHANTOM COILS,
W. E. For Inside or Pole.

COMPOSITE SETS — REPEATERS

POLAR RELAYS, W. E. #225A, Slightly Used $5.00
(Also 209, 239 and 280 Types) New ..$10.00
Western Union #202A (A.E.) New $15.00
Western Union 2A Spark Killer ¼MF.....$1.00
Western Union 255A Relay Test Sets ..$25.00
Western Electric (Signal Corps) 1-193 Relay Test Sets $100.00
Current Flow Test Set I-181, Per W. E. D-162269, Brand New $100.00

POLE LINE SPECIALS

Cross Arm Braces, 20"-22"	.20
Angle Thimbleye Bolts ⅝x14"	.50
¾x12"	.50
Lift Plates, 3 Hole ⅝"	.15
Guy Attachments, Chance 158, ⅝" (Similar to Jos. 6500, Hubb. 1100)	.35
Guy Attachments, Strap Type	
1 Hole	.15
2 Hole	.20
Clamps, Ground Rod, Cast Bronze ½" (Sq. Head Set Screw) 200 for	25.00
Machine Bolts ⅝ x 12"	.20
Double Arming Bolt, ⅝" x 12"	.25
½" x 22"	.25
Lay-Cit Grips (for Self-Supp. Cable)	.15
Bridging Connectors, W. E. #2A	.05
Lag Wrench, 4 Way to ¾" Nuts	1.00
Sleeves, Nicopress 1-102-C per C	3.00
Deadend-Off-Set 91-102-C per C	3.50
3-045 .. Per C	2.00
Nicopress Tools, #31-C or CQ	3.50
#17-2	2.00
Grips Wire, Klein 1613-30	2.00
Buffalo, with Double Block	3.00
Transposition Tool (Running bd)	7.50
Cable Car, with Chain & Brake	17.50
Good-Used	10.00
Handline, with Bronze Pulley	7.50
Rings, Cable Hanger, ass't size (Many Other Hardware Items)	
CABLE TEST SETS, Tone, W. E. 1020C, (with 716 Receiver & Exploring)	49.50
Less Exploring Coil	39.50

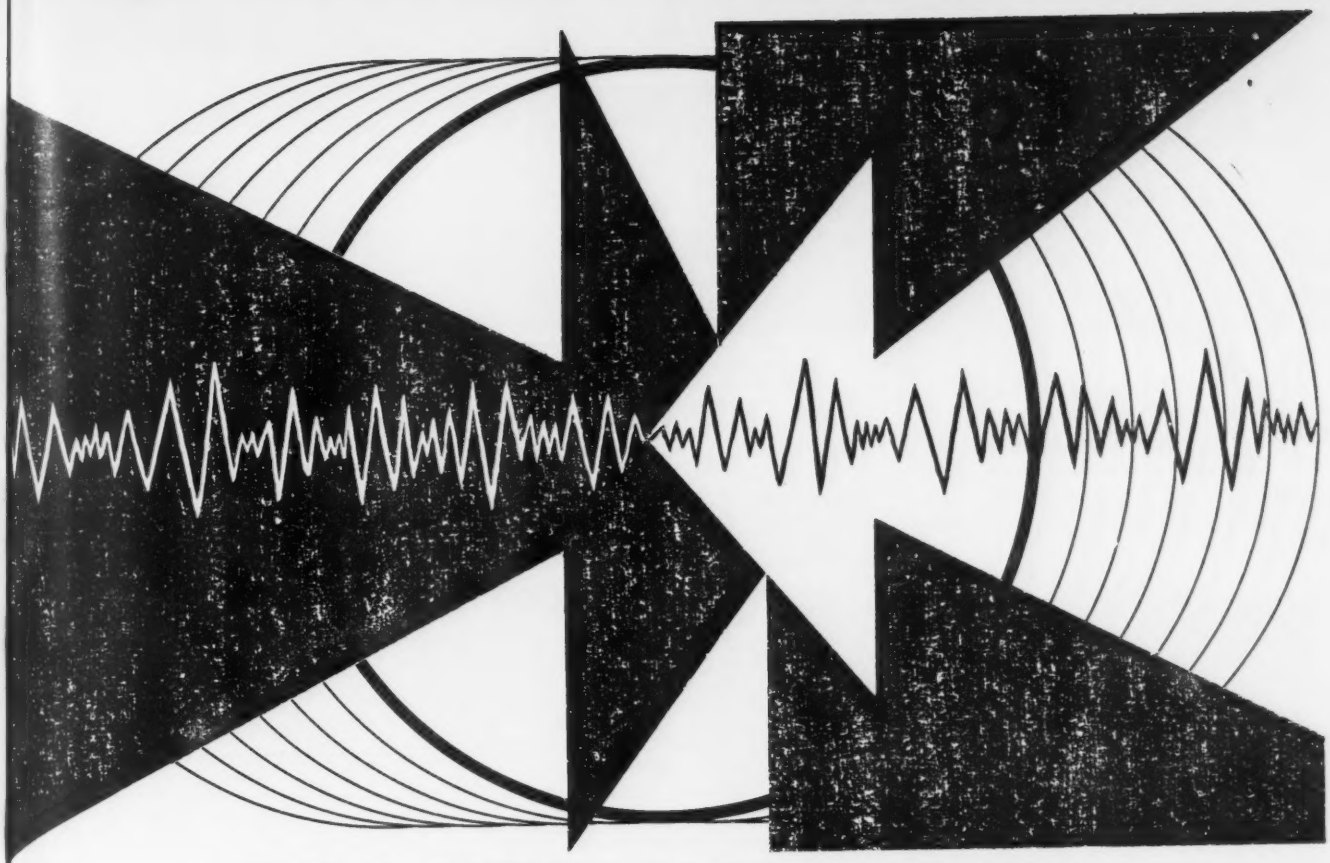
TRANSMISSION MEASURING SETS

W. E. 13A, Reconditioned	$100.00
32A, (Carrier)	100.00
19C Oscillator	150.00
51A Oscillator	100.00
Signal Corps 1-61 Combined Oscillator & Trans. Meas.	100.00

TEST BOARDS: Wire Chief's, with L&N Type U Bridge & Galv. for CB-LB Lines & Trunks with 180 Line Jack Field.
Jacks, Plugs, Test & Patch Cords, Relay Racks, Open & Enclosed.

Telectric Co.

1218 VENICE BOULEVARD **(DDD 213) RIchmond 8-2249** **LOS ANGELES 6, CALIF.**



RCA NEW YORK CITY

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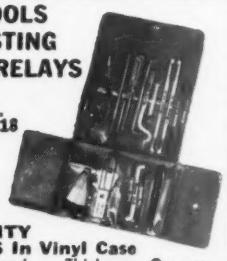

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News and views of Independent telephone people. VOLUME 9, NO. 6 • SEPTEMBER, 1960

In larger quarters,

Improvement lab meets growing new product challenge

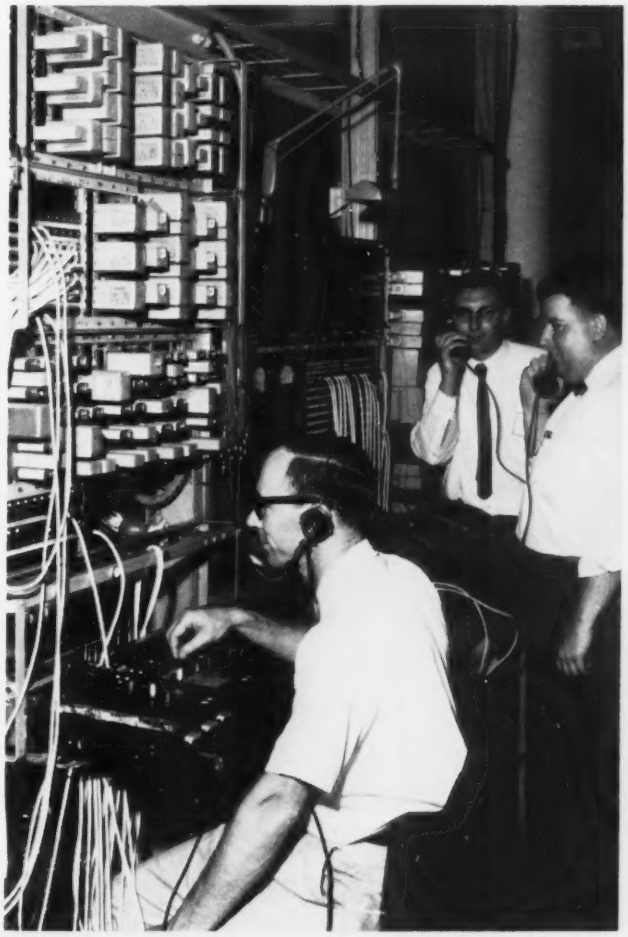
How do you improve an improvement lab? Ask engineers at Stromberg-Carlson; they just did it.

The special switchboard-design and product-improvement lab has moved to larger quarters at the Rochester, N. Y., plant. The added space will enable lab personnel to work more effectively in testing out the latest concepts in telephone equipment.

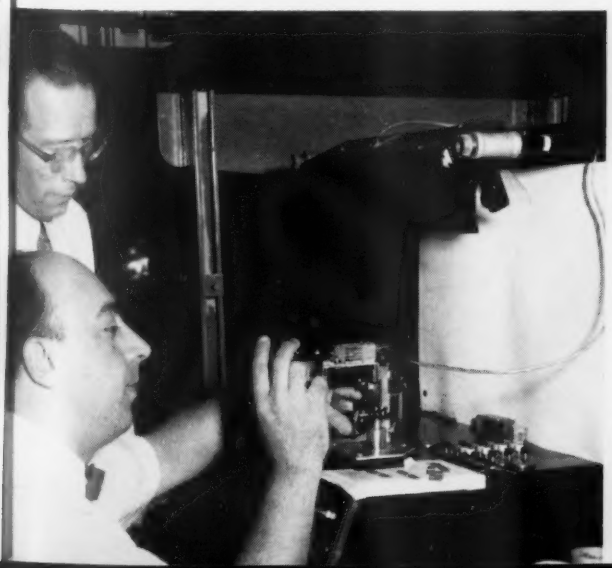
A rapid increase in new products designed to meet operating company needs spurred the move. Models of the PETITE phone required thorough testing to see that they would meet industry standards already set by Stromberg-Carlson's basic wall and desk instruments. Person-to-person, collect and special service (P.P.C.S.), a revenue-adding approach to Toll Ticketing, had to be carefully checked before production.

To insure that all testing would be completely accurate, a new power board was placed in the lab. The board supplies power, ground and

(*continued on next page*)

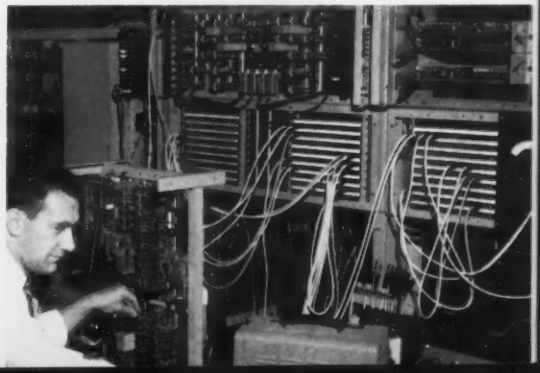


Engineers set up connection for multi-frequency dialing test. Rising industry standards require new concepts like this faster dialing system.



Tony Melkis, lab supervisor, standing, checks adjustment of a relay. The lab makes its own relays for use in testing special circuits.

A message circuit dialing test is run. Message circuit dialing speeds communications for industrial users.



Modern lab equipment boosts test accuracy

battery pulses, coin and ringing voltage. Testing standards are set beyond normal operating ranges to check equipment performance under toughest possible conditions.

A "controlled environment" room has also been added to the lab. Here, humidity and temperature are rigidly regulated to satisfy exacting requirements of XY component testing.

This is in the life-test room. All types of telephone apparatus undergo rugged tests here to insure that they will perform reliably when placed in the field.

Left—Playback of long-play Toll Ticketing recorder is checked for statistical data. The recorder uses magnetic tape, permits direct readout from remote offices.

Right—Toll Ticketing development supervisor Tom Redington, right, oversees test of P.P.C.S. operator link. Stromberg-Carlson's P.P.C.S. equipment can be added directly to existing XY Toll Ticketing offices for additional revenue.

Customer needs often require special circuit design. Here, a component is changed on a circuit plate prior to testing.

New power board supplies all necessary tone and signal combinations for accurate circuit testing.

DeKalb-Ogle (Ill.) Telephone adds Mt. Morris to dial service list

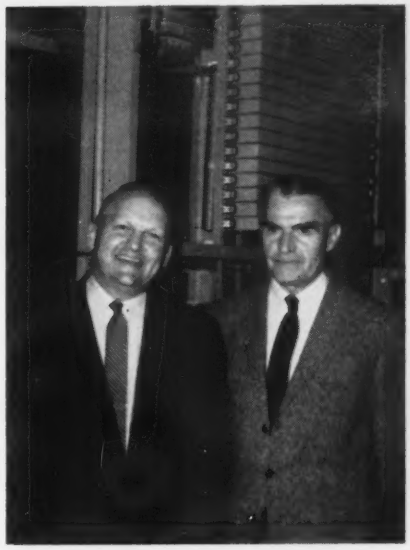
It's no secret what team the people of Mt. Morris, Illinois, would like to see win the American League pennant. They live just 100 miles west of Chicago and want the World Series right back in Comiskey Park, home of the White Sox.

But whether the Sox win or not, the town has already gone big league in the way of dial telephone service. The Mt. Morris office of the DeKalb-Ogle Telephone Company was recently cut over to XY Dial.

Like nearby Oregon, Illinois, which also has XY Dial, Mt. Morris is benefiting from the progressive attitude of the DeKalb-Ogle Company. Both president Clifford Danielson and vice president Daniel A. Schaefer are fully aware of the advantages of giving their subscribers the very best telephone service. The growth of the DeKalb-Ogle Co. indicates that their plan is producing results.

The company has also achieved outstanding success in PBX placement. Several XY PBX's are located in its operating area including one at the Northern Illinois State Teachers College.

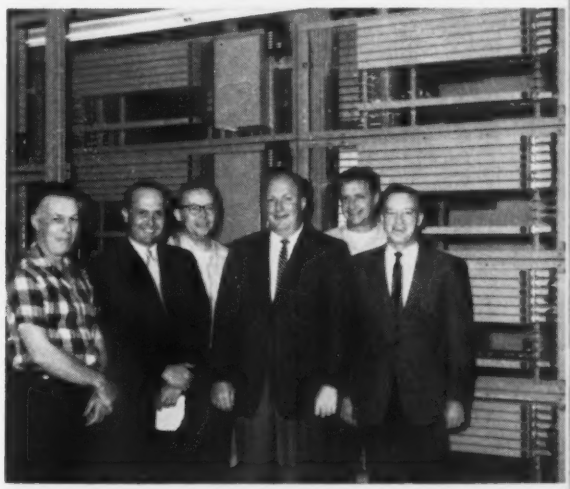
One of the largest Independents in the state of Illinois, the DeKalb-Ogle Company serves more than 25,600 subscribers. Company headquarters is in Sycamore, Illinois.



Daniel A. Schaefer, vice president, left, and Clifford Danielson, president, of the DeKalb-Ogle Telephone Company have provided this growing company with vigorous leadership.

These DeKalb-Ogle Tel. personnel played a major role in bringing XY Dial to Mt. Morris, Illinois. From the left they are: Don McArthy, Dave Conrad, Robert Ritland, Don Redmond, Martin Buse and Ken Crawford.

Modern plant for modern dial service. This is the Mt. Morris office of the DeKalb-Ogle Telephone Company.



Second spring former added

Another automatic spring forming machine has been installed at Stromberg-Carlson to satisfy growing relay production demands. Designed by Stromberg-Carlson engineers, the spring former tins the springs, welds precious metal contacts to them, rounds them out to meet specifications, pre-forms the springs, inspects them and rejects any that do not meet the exacting tolerances. Like the original spring former (shown in background), the new machine can turn out 4000 springs per hour.

New dial service approach benefits East Texas State College students

New dial system at East Texas State College will speed office communications while supplying students with superior telephone service.

As competition for a college education grows keener, universities demand more and more work from their students. But the responsibility is not all one-way; these institutions supply added services to meet student needs, too. Take the case of East Texas State College which offers a fresh approach to modern telephone service.

When students return to the campus at Commerce, Texas, this month, they'll find that the college has been busy during the summer vacation. Each room in the dormitories has been equipped with a dial telephone.

The phones will be operated on a two-party basis, and students will pay a fee to the college for their use. Gulf States Telephone Company of Tyler, Texas, will supply the Stromberg-Carlson switchboard.

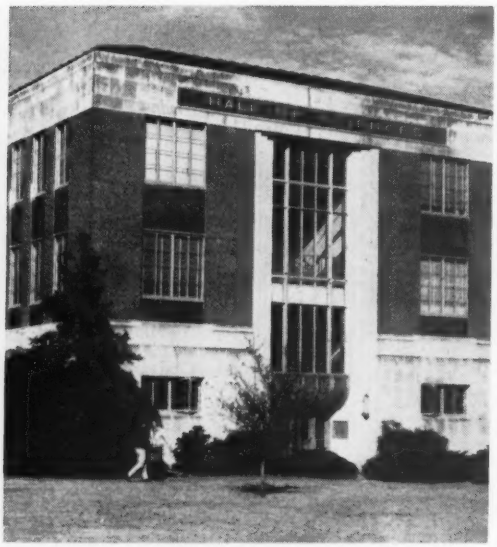
East Texas State College has 71 years of experience in the field of higher learning. Students may select their courses from 36 major fields and 11 pre-professional areas. The well-trained faculty is large enough to provide a realistic student-to-teacher ratio of 17 to 1. The hundred-acre campus in the southwest corner of Commerce, Texas, shows evidence of steady growth.

Building program continues

Thirty-five buildings make up the main campus. A new 1.2 million dollar library has just been constructed there. Other structures included in the latest campus improvement project are an art building and a combination business administration and audio-visual center.

The college owns and maintains its own water supply, in addition to a picnic ground, rodeo area and 500 acres of farm land. A modern dairy and meat packing plant furnish milk and meat for student use in the cafeteria.

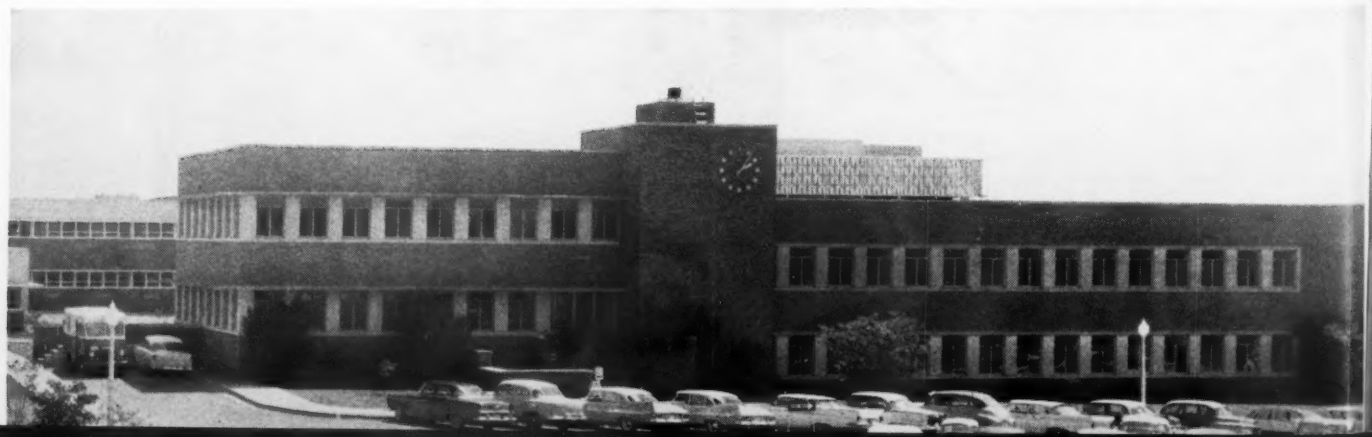
In 1889 the college was established as a private school by Professor W. L. Mayo. It became state supported



Future scientists spend much of their class day in this building. Biology, chemistry, geology and physics are among major courses of study offered in the sciences.

The new telephone system will help students to save steps and to make the most efficient use of their valuable study time.

The administration building is the hub of campus activity. From here comes the coordination that insures a smooth-running education program.



in 1917 and six years later was designated as a teachers college. The word "teachers" was dropped in 1957 by the Texas legislature because the college had broadened its scope beyond this definition. Since 1936, East Texas State has offered master's degree work.

Teamwork expands service

Working with the college on this new idea in student telephone service is the Gulf States Telephone Company. Gulf States is an old hand at finding better ways to improve service to subscribers.

Under the direction of vice president Morris S. Burton and Rolla L. Johnson, general manager, the company has forged ahead with an accelerated dial program. Twenty Gulf State offices are served by XY Dial. The company serves a total of 25,000 Texas subscribers.

The combined effort of telephone company and college has produced a progressive step in telephone service that's sure to rate an A+ with students at East Texas State College.

The EAST TEXAS STATE COLLEGE
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Announce the installation of a...
NEW DIAL SYSTEM for the
college campus. To be completed on or
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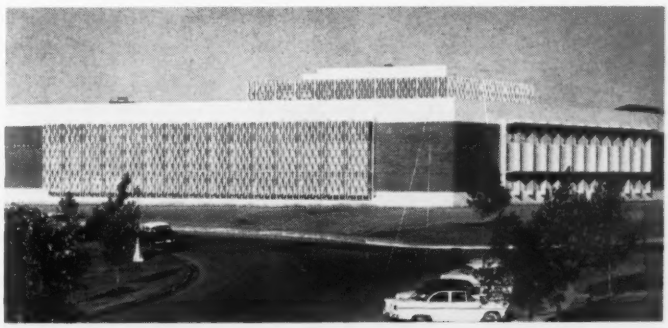
The housing office keeps busy meeting the demands of a growing student body. Close cooperation between telephone company and college contributed this latest step in student service.



Attractive and practical is the 1.2 million dollar library recently erected in the center of the campus.

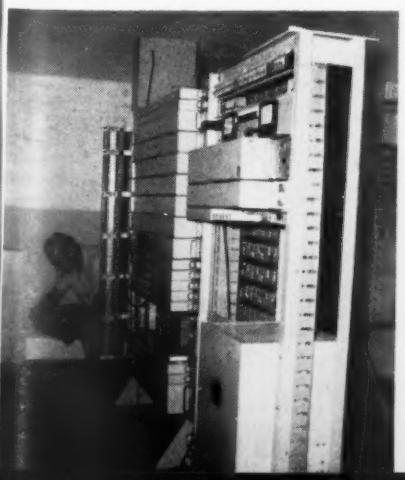
Northern Indiana Tel installs COMPAK-1, starts new era of small town dial service

Subscribers at Wawaka, Indiana, have learned that good things really can come in small packages. They are enjoying XY Dial service provided by the first installation of Stromberg-Carlson's new COMPAK-I. This lightweight, 100-line community dial office is designed to bring quality step-by-step dial service to small towns.

Richard House, manager of the Northern Indiana Telephone Company in Wawaka, was eager to offer his subscribers dial service. But until the COMPAK-I, no equipment existed which could make this feasible. Manager House has found that the COMPAK-I is perfectly suited to the needs of his community.

The Northern Indiana Telephone Company serves 270 subscribers in this fertile corn growing region northwest of Fort Wayne.

Manager Richard House runs a systems test on the small but sturdy COMPAK-I.



The COMPAK-I makes top quality XY Dial service possible in small communities. Manager Richard House wasted no time putting it to work serving his Wawaka subscribers.

Advertisement

Harold Baker, left, and Dave Penn, Stromberg-Carlson color specialists, use colorimeter to insure uniformity of shade in telephone instruments. Their work has contributed to the growing acceptance of the PETITE phone.

Light reflector adds colorful touch to instrument uniformity

When is a beige telephone not a beige telephone? Sounds like a tough riddle, doesn't it?

Two Rochester, N. Y., color specialists have found the answer. Their solution guarantees uniform color reproduction of any Stromberg-Carlson instrument that you order.

Using a prismatic device called a colorimeter, their system measures the percentage of light reflected from an object at various wave lengths. Ten readings are taken for any particular color. The readings are then computed to determine the hues that make up that color. Based on this information, a numerical value is assigned to each color.

This figure is then recorded and used as a standard for future reference. A beige phone manufactured six months from now will be identical in shade to one manufactured today.

Colors tested are taken from small rectangular plastic chips made from the same material as the finished telephone. The chips are furnished by the supplier of molding pellets used in making the phones. Having a def inite numerical value for each chi permits Stromberg-Carlson to orde the precise colors needed for its vari ous telephone instruments.

In recent months, the new PETITE telephone has undergone extensive color tests. After the five decorator colors were selected, samples were run through the colorimeter and standard values assigned. Each lot o PETITE phones must meet these color standards before shipment t the field.

The editor's mail

If the editor's mail is any indication, then the PETITE phone has already become a major topic of conversation among telephone people. Here are a couple of recent "in-box" arrivals.

* * *

George N. McBride of the West Coast Telephone Company sends along a photo he snapped at the Washington-Oregon Independent Telephone Associations' joint convention. The PETITE display was set up in the lobby of the Sheraton hotel in Portland, Ore., where the meetings were held.

More than 500 Independents attended the sessions and discussed current challenges in the telephone industry.

* * *

From down in the Southwest comes word that a relatively new Texan can officially feel like a native son now. He's Charley Fogg, Stromberg-Carlson sales representative in East Texas.

Charley's new status results from the "Texas hat" he won in a PETITE telephone sales contest sponsored by the Kansas City Branch.

Charley Fogg tries on his new Texas ha

Telephone men at Washington-Oregon convention got firsthand look at this PETITE display.

Transmitte
GEORGE B. FORBES, Edito
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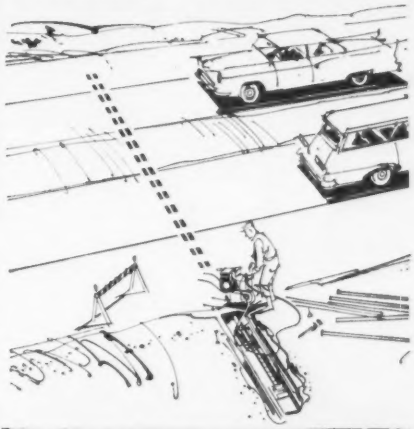

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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

"Space Communicators"

THE PAPERS, a few months ago, reported that two youngsters had performed a difficult feat that a great corporation and a complex Federal Government agency were working on. Radio hams Ray Soifer and Perry Klein were credited with being the first to achieve two-way radio communication by bouncing signals off a man-made satellite.

Ray spent the summer with Western Electric working in Project Mercury, in Defense Projects. A forthright and serious young man, he discounts the newspaper reports that he and his friend scooped Bell Labs and the National Aeronautics and Space Administration's Project Echo. "Since we weren't trying what they were trying, any question of priority involved would be academic."

Ray and his friend, the boy explained, were trying to relay a simple signal off a satellite already in orbit. They succeeded with either Sputnik III or Explorer VII (they couldn't be sure which) when both satellites were passing low over the ocean about 150 miles off Atlantic City. Ray was in New York, his friend in Bethesda, Md.

But even though Ray disclaims a scoop, the boys' achievement has certainly impressed their elders. The youngsters did their pioneering work on equipment that was not much more expensive than the usual ham radio, "a little better than average."

Collections By Boat

NEW JERSEY Bell is methodical concerning revenues. About once a month it sends a man as a part of his regular itinerary to empty the change boxes of two public phones located on Liberty Island (formerly Bedloes Island), where the Statue of Liberty guards New York harbor. And in Tuckerton, N. J., another Jersey Bell representative parks his car at a fishing pier and boards a tugboat to reach Crab Island in Barnegat Bay to harvest the public phone there.

Proof Of The Pudding

THE new dial system at Eastland, Tex., is working fine now, but A. D. Taylor, wire chief, won't soon forget the reaction of one of its users.

Taylor escorted the directors of the city chamber of commerce through the building while installation was still going on.

At the conclusion of the visit, one of the directors, a bewildered look on his face, told Taylor:

"Phone me when you get this thing fixed."

REX *will do almost anything to serve!*

Plastic Insulated Telephone Wire and Cable

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INDEPENDENT

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Let our "Revenue Men" show you

THE MEANING OF DIRECTORY COOPERATION!

Take a man like
Lew Beeler...

Lew Beeler is one of our "Revenue Men" in Fort Wayne, Indiana.

33 years old, Lew is a veteran of two wars. From 1943 to 1946 he served in the U. S. Navy as an aviation gunner in the South Pacific. In 1950, he returned to the Navy to serve during the Korean crisis.

At age 24, soon after his first Navy hitch, he became the youngest branch manager of a famous furnace manufacturing firm. Following his Korean War service, he worked as sales manager for a large men's store in Lafayette, Indiana.

It was in 1955 that Lew joined General Telephone Directory Company as a sales representative in our Lafayette Unit. In 1957 he was promoted to Sales Supervisor of this unit. And just this year, he was made Sales Supervisor of the Fort Wayne Unit.

Lew and his wife Wilma have three lovely daughters: Sandra Kay, 12; Darci De, 5; and Dani Jo, 3. Surrounded by women at home, Lew's outside activities include membership in such "men only" groups as BPOE, VFW and the American Legion.

Lew Beeler is typical of the "Revenue Men" who work for General Telephone Directory Company and for you. Men who are an asset to any community in which they live.

You get more than extra sales when you put one of our "Revenue Men" to work on your directory.

His manners, his methods will be a positive credit to your company. He'll be welcomed by your advertisers.

He'll work together with you to produce a book you can be proud of. A directory with complete Yellow Pages service–showing the public where to go for all kinds of purchases, rentals and services. A directory with maximum accuracy, maximum revenue.

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